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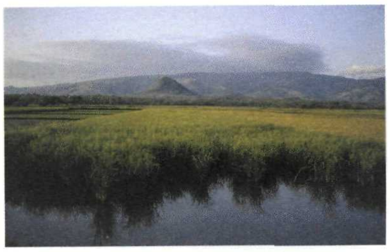

Operations, Maintenance, and Monitoring Annual Report

USEPA Docket No. V-W-99-C-543
2003 O&M Period
January 1 to December 31, 2003

HOD Landfill
Village of Antioch
Lake County, Illinois

April 2004

Prepared For

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RMT, Inc. | Operations, Maintenance, and Monitoring Annual Report
Final
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Section 1
Introduction

1.1 Project Background

The HOD Landfill is located within the eastern boundary of the Village of Antioch in Lake County, in northeastern Illinois. The site consists of approximately 51 acres of landfilled area situated on 121.5 acres of property. Permitted waste disposal activities began at the site in approximately 1963 and continued through approximately 1984. Currently, no waste materials are being actively landfilled at the site.

On April 14, 1999, the USEPA issued a Unilateral Administrative Order (UAO) that directed the HOD Site Respondents to develop and implement a remedial design and remedial action (RD/RA) plan for remedying the issues identified in the USEPA's Record of Decision (ROD), which was issued on September 28, 1998. The specific project remediation requirements are defined in the Predesign Investigation and RD/RA Workplan (RMT, 1999) and the Final RD Report (RMT, 2000b).

The RD/RA construction activities at the HOD Landfill began on August 21, 2000, and were substantially completed by October 2, 2001. The RA construction included site grading and waste relocation, improvements to the final cover system, the installation of both a dual leachate/gas extraction system and a leachate loadout and gas collection system, and site restoration activities (*e.g.*, road construction, and seeding, fertilizing, and mulching). The Interim RA Report (RMT, 2001d) was completed in October 2001.

Initial startup and maintenance of the gas and leachate management system began on April 3, 2001, and continued through December 2001. A report was submitted to the USEPA on April 10, 2002, that summarized the interim operation and monitoring activities for the HOD Landfill gas and leachate collection system (RMT, 2002).

During December 2002, RMT began construction of various portions of the HOD Landfill/Antioch High School gas-to-energy system. These included constructing a new compressor and gas conditioning building, creating a tie-in to the existing gas transfer piping, and installing new gas piping within the landfill cover from the gas conditioning building toward the site entrance.

1.2 Purpose and Scope

The RA for the site includes operation and maintenance (O&M) activities, such as inspections of the final cover systems and site monitoring networks; general maintenance; and landfill gas, leachate, groundwater, and surface water monitoring. Specific O&M activities for the site are identified in the Final O&M Plan (RMT, 2001c), the Quality Assurance Project Plan (QAPP) (RMT, 2001f), the Field Sampling and Analysis Plan (FSAP) (RMT, 2001b), and the Performance Standard Verification Plan (PSVP) (RMT, 2001e). In lieu of a fourth quarter O&M report, an annual report covering the 2003 reporting year is being submitted for the HOD Landfill. The purpose of this report is to provide documentation of O&M activities performed during the fourth quarter 2003 reporting period following completion of the interim operation period, as well as an evaluation of the groundwater, surface water, leachate, and landfill gas monitoring data collected during 2003. This report includes the O&M reporting period from October 1, 2003, through December 31, 2003, as well as the annual evaluation that covers the entire 2003 reporting year.

The scope of this report addresses the following:

- Fourth quarter inspection and maintenance activities
- A summary of annual operations and maintenance activities for 2003
- Fourth quarter environmental monitoring results
- Fourth quarter data quality evaluation
- Installation of various landfill components of the Antioch High School gas-to-energy system
- Future O&M of the HOD site related to the gas-to-energy system
- Future site activities
- Annual interpretation of quarterly groundwater, surface water, leachate, and landfill gas monitoring results for the 2003 reporting year
- Assessment of the effectiveness of natural attenuation of constituents of concern

Section 2
Site Inspections and Maintenance Activities

2.1 Fourth Quarter 2003 Inspections and Maintenance Activities

During the fourth quarter 2003 O&M period, inspection and maintenance activities occurred on October 6; November 1, 11, 16, and 18; and December 16. Each inspection event included an evaluation of the final cover system, the landfill gas perimeter probes, the dual leachate/gas extraction wells, the condensate sumps, the extraction system piping, the blower flare system, the groundwater monitoring wells, the fencing, the signs, and the access roads for the facility. The facility inspection reports are included in Appendix A.

The probes, wells, and piping systems were in good operating condition during the fourth quarter. No indications of burrowing or leachate seeps were discovered on the landfill cover areas. Additionally, there was no evidence of damage to the site fencing, signs, or access roads.

Site maintenance issues identified during the fourth quarter 2003 inspection events were as follows:

MAINTENANCE ISSUE IDENTIFIED	REPAIR OR REMEDY
Areas of sparse vegetation and weed growth were visible on the final cover.	Over-seeding and fertilizing was done in the third quarter 2003. As part of the final end-use plan, the site will be regraded, topsoiled, and revegetated.
Water was present in several vault boxes.	Water was drained from the wellhead vaults.
GP-3, GP-4A, and GP-5A require new locks.	New locks will be put on in the first quarter 2004.
The vault boxes at GW-32, LP-8, and GW-21 needed extensions.	A vault box extension was added at GW-32 in November; new extensions for other wells will be ordered, as required in the future.
The flex hoses at GW-34, GW-31, and MHE needed to be extended.	A new flex hose was installed in November.

MAINTENANCE ISSUE IDENTIFIED	REPAIR OR REMEDY
The wellhead valve at GW-21 requires repair or replacement.	This valve was replaced in November.
The brass leachate check valve at GW-24 needs to be replaced.	The valve was replaced with a Schedule 80 PVC valve in November.
Several leachate pumps were pulled, checked, cleaned, and adjusted, as needed.	The following pumps were done in November: GWF-2, GWF-3, GWF-10, GWF-21, GWF-22, GWF-24, and GWF-29.
Silicone caulk was needed around the wellheads at GWF-10 and GW-32.	The seal was repaired in November.

Other maintenance conducted in the fourth quarter 2003 included the following:

- The combustible gas meters in the compressor and dryer rooms were recalibrated.
- The vacuum levels at individual wells were adjusted based on gas level readings.
- The recorder paper supply was replaced.
- The bearings for the blower were greased.
- A-1 Air performed maintenance on the compressor and air dryer. Maintenance consisted of changing the oil, cleaning and replacing the filters, checking the desiccant, changing the mufflers, and adjusting the dryer valves.
- The wellhead at GW-31 was replaced, so that it would extend into the casing and have an airtight seal.

Actions taken to address these site maintenance issues are discussed in the Inspection and Maintenance Reports included in Appendix A.

2.2 Annual Evaluation

The site maintenance issues identified during the 2003 inspections were consistent with the type of issues that were expected to arise when the system was designed. For example, minor erosion and settling of the landfill cover were expected to occur and will continue to occur in the future. Equipment, such as the blower and pumps, underwent regular maintenance and was repaired or replaced as needed. Many of the repair and maintenance activities are related to ongoing removal of liquid from the landfill and the decomposition of waste. Future maintenance requirements are expected to be similar to those experienced in 2003 and will be addressed as they arise.

Major site maintenance activities performed during the 2003 O&M period consisted of the following:

- Jerry Berg Landscaping carried out final cover improvements, consisting of the removal of stones, the addition of fertilizer, and the seeding of sparsely vegetated areas. This work was performed in the third quarter of 2003.
- The header pipe south of the blower building was excavated and reset to eliminate a sag in the pipe, and to re-establish sufficient pipe slope to allow liquid to flow to condensate sump CS-1. The repairs to the settled header pipe were performed by Terra Construction and Engineering (Terra), who originally installed the gas and leachate extraction system as part of the remedial action (RA). For further details on this repair, please refer to the Second Quarter 2003 Operations, Maintenance, and Monitoring Progress Report.
- Terra regraded settled areas of the final cover and regraded the site access road. For further details on these activities, please refer to the Second Quarter 2003 Operations, Maintenance, and Monitoring Progress Report.
- Severn Trent/QED Environmental Systems inspected the pneumatic pumps and provided continued training for the RMT maintenance technician. Several pumps were pulled, cleaned, and serviced. A memo detailing this work can be found in the Third Quarter 2003 Operations, Maintenance, and Monitoring Progress Report.
- Pro Air serviced the landfill gas blower and air compressor on July 8, 2003, as described in the Third Quarter 2003 Operations, Maintenance, and Monitoring Progress Report.
- The leachate loadout pump was removed and serviced off-site by ITT-Flygt Corporation. While the pump was off-site for service, leachate was removed from the holding tank by vacuum tanker truck. The leachate loadout pump was reinstalled by RMT. This work occurred during the third quarter of 2003 on August 26, 2003.
- During 2003, various work was conducted on the gas system at the HOD Landfill for construction of the gas-to-energy system. Documentation of the work performed on-site will be forwarded as a separate report. The following is a summary of work performed:
  - **Created tie-in to existing piping.** In January 2003, connections were made to the existing gas header pipe and compressed air piping to allow for the future delivery of landfill gas and compressed air to the planned gas-to-energy system. The landfill gas would be directed to a gas conditioning building, where the gas would be compressed and conditioned before being sent to the microturbines at the Antioch High School. The compressed air would be needed to operate pneumatic valves in the compressor and chiller system.
  - **Rebalanced the well field for adjusted gas flow.** In November 2003, after the gas-to-energy system was installed, and startup activities had begun, the well field was rebalanced for a slightly higher gas flow. This higher flow from the well field was necessary to accommodate the additional gas requirements for the microturbines

while keeping the flow to the flare within the correct operating range. Balancing of the well field with the gas-to-energy system in operation is expected to continue during 2004.

- **Created tie-in to leachate collection tank.** Piping from the gas conditioning unit condensate handling system was connected to a new condensate sump located outside the gas conditioning building near the leachate collection tank. Condensate created by conditioning of the gas drains to this sump where it is then pumped via a forcemain, to the storage tank. This work was done in January 2003.

- **Rerouted landfill gas flow to prevent flare downtime.** Startup activities for the gas-to-energy system began in late October 2003. During the microturbine startup and troubleshooting periods, the flare would initially shut down in response to low gas temperature or often when too much gas would initially be required by the conditioning system. Usually, the flare would automatically restart, and both the blower/flare system and the gas-to-energy system would remain operational. Occasionally, when repeated startup and adjustment of the gas conditioning system were required, valves were adjusted to route the gas around the blower, directly to the gas-to-energy system compressor, whereby the gas compression unit would provide vacuum on the well field. This rerouting of landfill gas flow prevented repeated shutdowns and restarts of the flare, which interfered with the startup of the gas-to-energy system.

Section 3
Operation and Maintenance Environmental Monitoring

During the fourth quarter 2003 O&M period at the HOD Landfill, landfill gas, leachate, groundwater, and surface water were monitored. During each monitoring event, the barometric pressure, the weather conditions, and the ground conditions were recorded. In general, the environmental monitoring results indicate that the remedial system is being operated as designed. Gas flow rates ranged from 145 to 325 standard cubic feet per minute (scfm) during the fourth quarter, and the leachate extraction rate was approximately 3,650 gallons per day. The O&M environmental monitoring activities conducted are described in the paragraphs that follow.

3.1 Landfill Gas System Monitoring

Gas concentrations, including methane (CH_4), carbon dioxide (CO_2), and oxygen (O_2), were monitored at the header pipe to the flare, and at the 35 dual extraction wells with a Landtec® Gem 500/GA-90. Balance gas (nitrogen) was calculated as the net remaining volume fraction after the other measured constituents (CH_4, CO_2, and O_2) were accounted for. The wells and header pipe were also monitored for temperature, pressure (vacuum), and flow rate. Valve settings were recorded and adjusted, as necessary, to achieve a proper vacuum in the system. During startup of the gas-to-energy system, the well field was balanced to maintain proper vacuum on the system and to maximize methane concentrations of the landfill gas. Additionally, gas concentrations, percentage of the Lower Explosive Limits (LELs), and pressures were measured in the existing gas probes around the perimeter of the landfill.

3.1.1 Fourth Quarter Landfill Gas System Monitoring

Landfill gas monitoring events for the fourth quarter monitoring period were conducted on November 10, 11, and 16, 2003, for the dual extraction system. During the fourth quarter monitoring period, the total amount of gas flow to the landfill's flare ranged from 145 to 325 scfm, and the methane concentration ranged from 42.8 to 58.4 percent. Combustible gas concentrations were not detected in the perimeter gas probes during the fourth quarter 2003 monthly monitoring event performed on November 10 and 11, 2003.

3.1.2 Annual Evaluation of Landfill Gas System Monitoring

The results of the landfill gas monitoring between January 1, 2003, and January 1, 2004, are provided in Appendix B. The landfill gas flare is designed to operate at a flow of between 60 and 600 scfm. Based on site monitoring data and the printout of the continuous gas flow data, the gas flow for the landfill gas system while in operation ranged from approximately 150 to 350 scfm for the year. The methane concentration ranged from approximately 42.2 to 65.8 percent for the year, which is within the expected range. In the future, gas flow rates and methane concentrations from the gas extraction system may decrease as the rate of landfill gas generation decreases, owing to the ongoing decomposition of waste materials.

The landfill gas extraction system was modified in 2003 to allow for the utilization of landfill gas from the site in a gas-to-energy system now in operation at the Antioch High School. The system was started up in December 2003. The gas-to-energy system reduces the amount of landfill gas sent to the flare by approximately 150 to 200 scfm. As landfill gas production decreases over time, modifications to the flare may be needed to maintain efficient combustion. These potential modifications will be detailed in a future quarterly report in the event they become necessary.

The landfill gas system's flare was down on several occasions throughout the year as a result of mechanical problems or system maintenance. In addition, during startup of the gas-to-energy system, the flare was taken offline intermittently to facilitate testing of the gas-to-energy system. In the event of a flare shutdown, the flare was manually restarted, after notification was received from the automatic flare alarm system.

Currently, the flare system and gas-to-energy system operate together to extract and manage landfill gas. However, if the blower/flare system shuts down unexpectedly, the other system will also shut down. Plans are being developed to allow for the continued operation of the individual systems in the event of an unexpected shutdown of the other. For example, if the flare shuts down due to low temperature, the flare will be isolated from the gas flow piping and the control system will direct landfill gas drawn from the site directly to the gas-to-energy system.

3.1.3 Landfill Gas Record Keeping in the Future

Ongoing operation of the landfill gas-to-energy system that provides electrical and heat generation at the school includes additional record keeping beyond that done for the existing flare system. That additional information may include recording the hours of gas-to-energy system operation, the amount of downtime of the gas-to-energy system and the blower/flare system, the date and time of any alarms for the systems, the gas flow rates to the microturbines, and the gas flow rate to the flare. Any of this information to be included in the O&M reports will be determined after communication with the USEPA; however, it is anticipated that any applicable information relating to the O&M of the systems at the HOD Landfill will be included in future HOD quarterly and/or annual reports. In addition, maintenance and monitoring conducted on the gas-to-energy system at the landfill will be reported if it relates to, or affects, the HOD site, including the quality and the amount of gas delivered to the flare and energy system.

3.2 Leachate Collection System Monitoring

3.2.1 Fourth Quarter Leachate Collection System Monitoring

The leachate surface elevations and pump cycle counter numbers were recorded for each of the 35 dual extraction wells and the four condensate pumps during the fourth quarter 2002 O&M period. Flow measurements were calculated for the extraction wells and condensate sumps by recording the pump cycle counter numbers on November 10 and 11, 2003. As determined during the interim O&M period, one cycle of each pump was approximately equal to 0.115 gallon (0.435 liter/cycle) (RMT, 2002). However, this rate is somewhat variable because of the changing conditions of the individual pumps and wells; therefore, it will not correlate exactly with the amount of leachate hauled off-site. However, the cycle counters do give an indication of the relative volume of liquid being removed from the various areas of the landfill.

Liquid level measurements were taken at the individual extraction well locations during this quarter as described in the Final O&M Plan (RMT, 2001c). The liquid level within the leachate holding tank was monitored on a continuous basis by a pressure transducer within the tank during the fourth quarter 2003 O&M period. PATS Service, Inc. (PATS), of New Munster, Wisconsin, hauled the collected leachate off-site to the City of Burlington, Wisconsin, Wastewater Treatment Plant. A total of approximately 336,000 gallons (or an average of 3,652 gallons/day) of leachate were hauled from the HOD Landfill during the fourth quarter 2003 O&M period. Summary graphs of the monthly and quarterly leachate elevations and volume pumped between January 1, 2003, and January 1, 2004, are provided in Appendix C. The pumping rates that are summarized on the graphs are averaged over the entire quarter.

A sample was collected from the leachate holding tank on November 21, 2003, for analysis of the parameters on the annual parameter list. The data quality evaluation of this analysis is contained in Section 4 of this report. A copy of the analytical results is contained in Appendix D. A summary of the detected constituents that exceed leachate protection standards (as defined by Table 1-4 of the QAPP) is contained in Appendix E.

3.2.2 Annual Leachate Collection System Monitoring

Summary graphs of the monthly and quarterly leachate monitoring between January 1, 2003, and January 1, 2004, are provided in Appendix C. A total of approximately 1,314,000 gallons (average of 3,600 gallons/day) of leachate were hauled from the HOD Landfill during the 2003 reporting period. This relates well to the fourth quarter average of approximately 3,650 gallons per day. Based upon design calculations and projections, leachate quantities pumped from the landfill were predicted to be between 4,000 and 6,000 gallons per day. As expected, the year-to-year volume of leachate pumped from the landfill decreased in 2003 compared to 2002 (average of 4,316 gallons/day) as the cumulative volume of leachate removed from the site increased.

The capacity of the leachate storage tank appears to be more than adequate for the landfill. The average daily volumes of leachate being collected from the site result in the tank providing greater than 5 days of storage capacity. Based on the trend of decreasing pumping rates, increased storage capacity are expected in 2004. Any issues that arise regarding the adequacy of leachate storage capacity will be addressed by increasing the loadout frequency (*e.g.*, increasing the loadout schedule), or by increasing the number of tanker trucks servicing the site. The small quantities of condensate generated by the gas-to-energy system (estimated at 20 gpd) will have no impact on the amount of storage capacity needed on-site.

The leachate monitoring program evaluates and tracks the effectiveness of the active leachate extraction system at creating an inward hydraulic gradient from the surficial sand aquifer in the vicinity of the site into the landfill (RMT, 2001e). The O&M Plan (RMT, 2001c) details the methodology used to calculate the stabilized leachate levels in the 2002 annual evaluation. For the 2002 Annual Report, the leachate levels were measured 48 hours after the pumps were shut off. The stabilization coefficient calculated during the leachate head drawdown recovery investigation in January 2002 (Appendix F of the 2002 Operation, Maintenance and Monitoring Annual Report – RMT 2003) was then used to calculate the stabilized leachate levels for the fourth quarter 2002.

The results of the fourth quarter 2002 leachate monitoring event showed the stabilized recovery of each well was generally similar to the measured recovery during the leachate head drawdown investigation from January 2002. However, at seven of the wells, the responses did not reasonably compare to the results from the January 2002 drawdown investigation because the recovery in the fourth quarter 2002 was much greater at 48 hours than in January 2002. The reason for that is the stabilized recovery coefficient determined during the leachate head drawdown investigation is time-dependent which resulted in the calculated stabilized recovery being much greater than the total measured recovery from the leachate head drawdown investigation.

Overall, this method (as detailed in the Final Operation and Maintenance Plan [RMT, 2001c]) utilized to determine the leachate elevations within the HOD Landfill during the 2002 Annual Report yielded results which were difficult to interpret. The following factors presented difficulties in determining the leachate head from the leachate head measured after the 48-hour shutdown:

- The calculations used to estimate the ambient leachate level are based on recovery curves developed for each leachate well during the leachate head drawdown investigation. When the fourth quarter 2002 measurements were made, some leachate pumps were not operating at all, or were operating at a lower pumping rate. Thus, at these wells, the leachate level was already stabilized or was very near the ambient head for this portion of the landfill. The application of a recovery coefficient to these wells resulted in anomalously high estimated leachate elevations.
- Leachate head measurements made during 2001 were not always consistent between manual tape and pressure transducers, resulting in anomalous results when some of the 2002 data were compared with the leachate head drawdown investigation.
- Overlapping well responses were observed during the leachate head drawdown investigation, indicating that some adjacent leachate pumping wells were influencing the recovering leachate head at tested wells. Thus, the results of the leachate head drawdown investigation, during which groups of four wells were shut down, may not have comparable recoveries to a site-wide shutdown.

Based on these concerns, the method used for the analysis of leachate drawdown during 2002 was modified to increase the accuracy of the leachate head measurements. The modified method for 2003 was discussed with USEPA prior to implementation. The modified method consisted of a site-wide shutdown of all leachate wells for 7 days, allowing the leachate in each well to reach a stabilized elevation without the need for additional calculations or coefficients. This approach allows enough time to complete system maintenance or repairs during the shutdown period. By using actual direct measurements of leachate heads, all wells in the leachate monitoring network could be used to develop a head level map for the site. The method used for 2002, which relied on a shorter shutdown period and a calculated ambient leachate head value, excluded leachate wells with anomalous recovery responses, as described in the leachate head drawdown investigation (RMT, 2003).

Leachate head measurements for the fourth quarter 2003 monitoring event were made as follows:

- On November 10, 2003, all pneumatic leachate pumps were shut down.
- During the 7-day shutdown, air lines were blown out to remove moisture and debris prior to winter, and the leachate and condensate pumps were pulled, as required, for maintenance, and cleaning and repairs.
- On November 17, 2003, the leachate elevations were measured in all leachate wells, followed by restarting of the pneumatic pumps.

This method for measuring the stabilized leachate elevation in each well was used in 2003 to increase the accuracy of the leachate head measured in the landfill. Data from the leachate head drawdown investigation were used as a basis for the 7-day recovery period in the fourth quarter 2003 monitoring event. During the leachate head drawdown investigation, 21 of the 29 leachate wells with recovery information reached full recovery within 7 days (168 hours). Of the eight wells that did not reach recovery at 7 days (GW-19, GW-22, GW-25, GW-26, GWF-2, GWF-5, GWF-8, and LP-1), only one well (GW-19) took longer than 9.3 days to reach full recovery. At 7 days, however, the differences between the leachate head in these seven wells and the fully recovered leachate head were within the range of measurement error. Thus the modified method provides a reasonably accurate means to determine of the stabilized leachate head in the HOD Landfill.

Table 3-1 presents the leachate levels within the extraction wells as measured on November 17, 2003, 7 days after the pumps were shut off for the 2003 fourth quarter monitoring event. Figure 3-1 shows the leachate head levels measured prior to the onset of pumping in January 2001 (baseline levels). Figure 3-2A shows the leachate head levels from the November 2003 monitoring event and Figure 3-2B shows the net change in leachate head since the baseline levels were measured in January 2001. Shallow groundwater head values measured during the 2003 fourth quarter monitoring event are also shown on Figure 3-2A to show the gradients between shallow groundwater and leachate levels within the landfill. Table 3-2 includes a comparison of the 2003 fourth quarter leachate levels to the leachate levels required for an inward gradient, as specified in the Performance Standards Verification Plan (PSVP) (RMT, 2001e).

Table 3-2 shows a comparison of the fourth quarter 2003 leachate levels to the initial leachate levels recorded in January 2001, at the time of pump installation. Overall, the data indicate that the leachate head levels are being systematically lowered owing to the leachate extraction system. Individual well productivity and drawdown responses varied widely from well to well because of the heterogeneous nature of the landfill, including the heterogeneity of refuse (*e.g.*, waste type, compaction, degree of decomposition, gas content, and temperature), the presence of daily and intermediate covers, the effect of landfill gas pressure buildup, and landfill geometry (*e.g.*, buried berms, ridges, and trench disposal geometry). The leachate levels will continue to be monitored in the future.

Figure 3-2A shows the groundwater elevations in the shallow sand and gravel aquifer as well as the stabilized leachate elevations for the fourth quarter monitoring period (last column of Table 3-1). This figure shows that the groundwater gradient in the shallow sand and gravel aquifer is generally toward Sequoit Creek. A gradient toward the new landfill exists, in the central portion of the southern site boundary, based on the hydraulic heads in the groundwater and leachate, respectively. The horizontal gradient in other parts of the southern site boundary, however, is away from the landfill toward Sequoit Creek.

Based on design estimates and preliminary data, the average leachate level in the landfill was projected to decline to 761 feet above mean sea level (A.M.S.L.) in approximately 9 to 12 years (RMT, 2001e), with an approximate average leachate drawdown of 34 percent of the target drawdown after the first year and 48 percent after the second year (RMT, 2001a). The average leachate level in the landfill in the fourth quarter of 2003 was 765.1 feet, which is approximately 54 percent of the required elevation change. This percentage is slightly better than that projected for this period. This average leachate level is higher than the average leachate level calculated for the fourth quarter of 2002 (761.2 feet), but the apparent rise in leachate elevations is likely a result of the different methods used between 2002 and 2003, as discussed above. Overall, the leachate levels appear to be decreasing at rates consistent with predictions made during the design process, and confirm that the leachate collection system is working as designed. Based on the fourth quarter 2003 leachate levels, the long-term drawdown prediction does not need recalibration at this time. The leachate levels will continue to be monitored. The schedule for achieving an inward gradient will be revised if necessary, as outlined in the PSVP (RMT, 2001e), and in consultation with the USEPA.

Leachate samples were collected during each quarter of 2003 and analyzed for the list of quarterly leachate parameters in Table 3-6 of the Field Sampling and Analysis Plan (FSAP) (RMT, 2001b). Analytical results from the first through the third 2003 quarterly monitoring events were provided in those respective quarterly monitoring reports. On November 21, 2003, the annual leachate sample was collected for analysis of an expanded list of parameters. The quarterly and annual leachate samples are compared with the effluent standards for disposing the leachate off-site (*i.e.*, effluent that meets the standard would not require off-site disposal) as described in Table 1-4 of the QAPP (RMT, 2001f).

The 2003 quarterly leachate sample analyses (first through third quarters) indicate that off-site disposal continues to be required for the leachate because of the concentrations of BOD, iron, and TSS. The concentrations of these parameters are above the threshold (exceed) for the standards requiring off-site disposal. Table 3-3 shows a comparison between the annual leachate analytical results and the effluent standards for disposing the leachate off-site. The annual leachate sample results were below the off-site disposal standards for all parameters except BOD, fluoride, iron, and phenols. No modifications are required or proposed for the current leachate disposal program, based on the leachate sample analytical results for 2003. These results will continue to be monitored in the future.

3.3 Groundwater Monitoring

The list of groundwater monitoring well locations and analytical parameters required for the quarterly monitoring program is presented on Figure 3-3 of this report. As documented in the Field Sampling and Analysis Plan (FSAP) (RMT, 2001b) and the Performance Standards Verification Plan (PSVP) (RMT, 2001e), each location was chosen on the basis of hydrostratigraphy and its up- or downgradient position relative to the site. The annual summary report requirements for groundwater monitoring are described in Sections 7 and 8 of the PSVP.

The annual evaluation of the groundwater monitoring program provides an interpretation of the results from the four quarterly monitoring events during 2003 and includes an assessment of the effectiveness of natural attenuation of constituents of concern. The annual evaluation of the groundwater monitoring program focuses on the two aquifers monitored at the HOD Landfill: the shallow, unconfined sand and gravel aquifer that is present only near the southern and western edges of the landfill, and the confined deep sand and gravel aquifer (DSGA) that underlies the entire site. Groundwater elevations in the clay-rich diamicton that separates the two aquifers are measured and recorded to assess any changes in vertical gradients between the two units. A detailed description of groundwater occurrence and flow at the HOD Landfill is provided in the predesign investigation results for groundwater (RMT, 2000a).

3.3.1 Groundwater Level Measurements

Fourth Quarter 2003

On November 18, 2003, groundwater levels were measured in the monitoring wells at the HOD Landfill, as summarized in Table 3-4 of this report.

Annual Evaluation

Groundwater head elevations from the first through the third 2003 quarterly monitoring events were provided in those respective quarterly monitoring reports. The groundwater head elevations from all four quarters of 2004 were evaluated by comparing the elevations in each event with historical elevations and assessing the hydraulic head distribution at the HOD Landfill. In addition, annual groundwater head patterns were evaluated with respect to the Village of Antioch municipal well pumping scheme for 2003 and the surface water elevations of Sequoit Creek.

The groundwater level measurements during each quarter of 2003 were performed in accordance with the FSAP and the PSVP. Owing to the highly variable flow pattern in the DSGA, as discussed in the 2002 Operations, Maintenance, and Monitoring Report (RMT, 2003) and described in the Predesign Investigation (PDI) groundwater report (RMT, 2000a), the following conditions of the groundwater level measurements are noted:

- Groundwater levels for each quarter of 2003 were measured, generally within a 5-hour period, to minimize uncertainty in the groundwater elevations and flow direction.
- All of the groundwater level measurements made at the HOD Landfill since the second quarter of 2002 have been performed by the same RMT field geologist, who has 7 years of monitoring experience.
- Measurements were made from a surveyed point at the top of the well casings. The surveyed well elevations were made by a registered land surveying firm. The surveyed well elevations have not been resurveyed at any points because no damage has been observed at any of the well casings.

During the 2003 operations, maintenance, and monitoring period, the groundwater monitoring network provided sufficient data for evaluating groundwater flow and direction. One well, PZ-02U, was found in February 2003 to have a blocked riser that prevents water elevation measurements. Five wells, W-03D, W-03SA, W-03SB, PZ-01U, and PZ-03U, were inaccessible during the third quarter 2003 events because of high water in the vicinity of these wells. One well, PZ-01U, was inaccessible during the fourth quarter 2003 event, also because of high water in the vicinity of this well.

Water table - Water table elevations in 2003 were consistent with historical measurements and seasonal trends. Water table elevations in 2003 were highest during the third and fourth quarter and lowest during the first quarter, owing to the seasonal distribution of rainfall and evapotranspiration. Groundwater in the shallow unconfined sand and gravel aquifer generally flowed toward Sequoit Creek during 2003, consistent with historical records.

Deep sand and gravel aquifer (DSGA) - Groundwater elevations measured in 2003 in the DSGA were similar to historical measurements. The potentiometric surface in the DSGA, however, exhibited greater variability in 2002 and 2003 than had been observed in the past. Potentiometric surface maps showing groundwater elevations and hydraulic gradient directions in the DSGA during each quarter of 2003 are provided on Figures 3-4 through Figure 3-7. The timing and rate of pumping for two municipal wells in the DSGA, Village of Antioch wells VW-3 and VW-4, are also shown on Figures 3-4 through Figure 3-7 for each quarter of 2003.

As reported in the PDI groundwater report (RMT, 2000a), the potentiometric surface in the DSGA was found to be strongly influenced by the confined conditions in the DSGA and the effects of pumping from the Village of Antioch municipal wells to the west and south of the landfill. During the PDI in December 1999, detailed water elevation measurements were taken in the DSGA both manually and using pressure transducers. The conclusion of that investigation was that flow in the DSGA is predominantly to the south in the southwestern corner of the landfill. Based on the results of the PDI groundwater investigation, R-1D was installed south of the landfill, between the landfill and the Village of Antioch municipal well 5 (VW-5 on Figures 3-4 through Figure 3-7). R-1D was installed to serve as a downgradient monitoring point to assess the progress of natural attenuation in the DSGA in this area and to monitor groundwater quality near municipal well 5.

During 2002 and 2003, groundwater flow directions in the DSGA were consistently to the southwest in the northwestern potion of the site, which is consistent with the PDI groundwater investigation. However, in the southwestern portion of the site, the groundwater flow directions in 2002 and

2003 were different from what was found in the PDI groundwater investigation. In 2003, the direction of groundwater flow in the southwestern corner of the landfill varied from east (Figure 3-4), east and west (Figure 3-5), east (Figure 3-6), and southeast (Figure 3-7). The flow directions in the DSGA observed over the last 2 years in the southwestern corner of the landfill are more variable than the directions observed in the DSGA during the PDI in December 1999.

As discussed in the 2002 Operations, Maintenance, and Monitoring Report (RMT, 2003), it is not clear if the observed variability in groundwater flow directions in the DGSA is a result of changes in the hydrology or groundwater use of this aquifer. The reduced pumping at the Village of Antioch municipal well 5 was suggested as one possible explanation for the variability in the 2002 groundwater elevation data. The continued variability in flow directions in the DSGA in 2003, however, was less pronounced near municipal well 5, despite a similar pumping schedule at this well. Detailed analysis of the monitoring wells' water levels during pumping indicates that the response to pumping is very rapid, with changes of up to 1 foot occurring in as little as 3 to 4 hours (RMT, 2003). With this large and rapid of a response to pumping, it is likely that the variability in hydraulic gradients is a reflection of the variability of the pumping at the two nearest village wells.

Groundwater elevations in the DSGA have been shown to respond to pumping, but it is possible that other hydraulic factors influence (or compound) the effects of pumping on the groundwater elevations, as well. Thus, while pumping is influencing the groundwater flow directions in the DSGA, a direct correlation between flow direction and specific pumping schedules is not observed because of the complex hydrology of the aquifer.

Continued monitoring of groundwater levels as specified in the groundwater monitoring program is recommended to establish a longer record of groundwater flow in the DSGA from which to better assess the hydrology in the DSGA. The current monitoring well coverage remains sufficient to identify and monitor the direction of groundwater flow in and around the HOD Landfill.

Village of Antioch Municipal Well Pumping

The Village of Antioch municipal wells pump water from the DSGA at various locations west and south of the HOD Landfill. Village wells VW-3 and VW-5 are located approximately 1,000 feet west and 1,700 feet southwest of the landfill, respectively. The village well pumping scheme in 2003 was evaluated to determine if significant changes have occurred with respect to previous years. With the exception of decreased pumping in municipal well 5, as noted above, the Village of Antioch pumping scheme has remained consistent. The Village of Antioch municipal wells operate automatically, based on the water pressure in the municipal water supply system. Municipal wells pump alternately in pairs based on the system's water pressure. The pumping cycle is described in more detail in the predesign investigation results for groundwater (RMT, 2000a).

The Village of Antioch anticipates to increase pumping from the DSGA in the coming years (personal communication, Bill Smith, March 14, 2003). A new residential development to be located approximately 2 miles east of the HOD Landfill has been proposed for 600 to 800 homes over the next 3 to 4 years. A 16-inch water main is under construction to provide water to these homes from the existing municipal well system. Two new wells, however, are ultimately planned for a location near the development. Currently, approximately 20 homes have been built in the new residential development, and these homes have been using water from the existing municipal well system (personal communication, Dave Hanson, January 14, 2004). The volumes used by the 20 homes, however, will not likely have a measurable effect on the municipal pumping volumes. Additional changes to the Village of Antioch municipal well pumping scheme will be evaluated as these plans are further developed.

3.3.2 Groundwater Sampling

Fourth Quarter 2003

Sixteen samples of groundwater were collected between November 18 and 21, 2003, for analysis of the parameters on the quarterly parameter list, as provided in the FSAP (RMT, 2001b). A data quality evaluation of the results is contained in Section 4 of this report. A copy of the analytical results is contained in Appendix F, and a summary of detected constituents exceeding applicable standards is contained in Appendix E. Appendix G contains a copy of the analytical results in an electronic format.

Annual Evaluation

Groundwater analytical results and exceedence reports from the first through the third 2003 quarterly monitoring events were provided in those respective quarterly monitoring reports. As part of this evaluation, the groundwater analytical results from all four quarters of 2003 were evaluated and compared with the historical data for the HOD site. The analytical results were also evaluated in the context of the data validation that was performed on each of the quarterly analytical reports and described in each quarterly report. A discussion of each exceedence of the site-wide groundwater quality standards is also provided. Finally, an interpretation of specific analytical results from 2003 in the DSGA is provided in Subsection 3.3.3 as part of the annual evaluation of the selected remedy for groundwater at this site, monitored natural attenuation (MNA).

Exceedences of the site-wide groundwater protection standards, as defined in the PSVP (RMT, 2001e), were reported at eight wells (upper sand aquifer wells PZ-4U, US-4S and W-6S and DSGA wells US-1D, US-3D, US-5D, US-6D and W-8D) in the groundwater monitoring network in 2003. These wells are all located south, southwest, or southeast of the landfill. A summary of the annual groundwater exceedences is provided in Table 3-5. Two exceedences for sulfate at W-6S were not reported in previously submitted exceedence reports for the first and third quarters owing to a database management error. As shown in the table, the 2003 exceedences are classified as either validated or suspect. A discussion of the 2003 exceedences and the basis for classifying the suspect exceedences is provided below.

Validated exceedences of site-wide groundwater protection standards - Four inorganic compounds (dissolved iron, dissolved manganese, sulfate, and total dissolved solids) were found to be present at concentrations exceeding site-wide groundwater standards at a few site monitoring wells during various quarters in 2003.

The dissolved manganese and iron exceedences at well W-6S are interpreted as being indicators of the chemically reducing conditions present in this well. Elevated concentrations of these compounds are commonly found in groundwater where the degradation of natural or anthropogenic carbon is occurring. As available oxygen is consumed, manganese and iron coatings on sand grains are used as terminal electron receptors by bacteria, resulting in the production of dissolved iron and manganese. The sulfate exceedences at well

W-6S in the first, third, and fourth quarters of 2003 indicate that the reducing conditions in this well are not strong enough for sulfate reduction.

The dissolved manganese and sulfate concentrations at W-6S in 2003 are slightly higher than in 2002. Two potential causes of these increased concentrations, more strongly reducing conditions and higher concentrations of contaminants, are unlikely, based on the 2003 data from W-6S. The persistence of sulfate in W-6S indicates that the geochemical conditions in W-6S have not become methanogenic. Likewise, no increases in VOCs in W-6S were observed in 2003. The slight increases of manganese and sulfate concentrations at W-6S may reflect the natural variability in the shallow groundwater system. Finally, the total dissolved solids (TDS) exceedences at W-6S during each quarter of 2003 were only slightly higher than the site-wide groundwater quality standard and are similar to historical results for this well.

The dissolved manganese exceedences during three of the four quarters of 2003 at DSGA well W-8D, and one quarter of 2003 in PZ-4U, may also be the result of reducing conditions measured in these wells. These two wells are located in an area with seasonally wet soil that is commonly associated with elevated dissolved iron and manganese concentrations in natural environments. The concentrations of dissolved manganese in W-8D and PZ-4U measured in 2003 are consistent with measurements from previous years. The inorganic exceedences at HOD are consistent with previous results, and warrant continued monitoring.

Three wells with volatile organic compound (VOC) exceedences in 2003 have groundwater analytical results generally consistent with similar compounds reported in the RI/FS (Montgomery Watson, 1997) and PDI-groundwater (RMT, 2000a). Exceedences of cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride have been reported historically at US-3D. The concentrations of cis-1,2-DCE and vinyl chloride measured in US-3D during 2003 are consistent with the results from 2002. The trend in VOCs at US-3D is discussed in more detail as part of the monitored natural attenuation (MNA) evaluation in Subsection 3.3.3 of this report. Vinyl chloride was measured at concentrations above the site-wide groundwater quality standards in two on-site shallow sand wells (US-4S and W-6S) during quarters two and three of 2003, respectively. Chlorinated VOCs have been detected in these two wells historically, but they have not been found to be present in the on-site DSGA wells. This indicates that downward migration of VOCs from the shallow sand through the underlying clay diamicton is not occurring on-site.

Suspect exceedences of site-wide groundwater protection standards - One compound, bis(2-ethylhexyl)phthalate (also known as di-[2-ethylhexyl]phthalate or DEHP), was reported in samples from three wells (US-1D, US-5D, and US-6D) during 2003 at concentrations exceeding the site-wide groundwater standards. DEHP is a common laboratory contaminant, because it is widely used in plastics, including PVC, and in sampling and laboratory equipment. The DEHP exceedences at these wells are suspect, based on the potential for field and laboratory contamination of this compound, the lack of other indicators of groundwater contamination in these wells, and the presence of this compound in laboratory method blanks during analysis of samples from the HOD Landfill.

Historically, DEHP has been previously detected above the site-wide groundwater standards at the HOD Landfill and has been considered suspect because of historical detections of this compound in laboratory method blanks. During the second quarter of 2003, DEHP results for three samples (W-08D, US-05D, and US-01D) were qualified based on the presence of this compound in the laboratory method blanks. The results at these wells were "u"-qualified as not detected according to USEPA protocol. Although DEHP was not present in the method blank for the sample extraction group that included US-06D, the result is suspect because DEHP is a common laboratory contaminant and was present in other laboratory method blanks. DEHP was detected at a low level in a laboratory method blank during the fourth quarter, but the results for US-1D and US-5D were not qualified during data validation because the reported results were greater than 10 times the amount in the blank. The DEHP exceedences at US-1D and US-5D, however, are also considered suspect for the reasons discussed above.

The recurrence of DEHP exceedences at wells US-1D and US-5D in 2002 and 2003 may be due to the contamination of these samples by sampling equipment as well as laboratory materials. DEHP detections have been found at some sites to be the result of degradation of the aging well casing, microbial action (iron bacteria) on sample tubing and abrasion on the well casing bailer and rope associated with bailing procedures. Samples from US-1D and US-5D are collected using dedicated sample materials, but there have been instances at other sites where tubing dedicated to the well contained significant concentrations of DEHP.

Continued monitoring of the suspect exceedences at the HOD Landfill is recommended.

3.3.3 Evaluation of the Effectiveness of Monitored Natural Attenuation (MNA)

The groundwater quality results for the four 2003 quarterly monitoring events were used to evaluate the groundwater MNA conditions in the DSGA at the HOD Landfill. Water quality in the DSGA was evaluated in accordance with the following three general lines of evidence that can be used to support demonstrations of natural attenuation, as described in USEPA guidance (1999a):

1. Historical concentration trends that show decreasing contaminant mass and/or concentration over time
2. Hydrogeologic and geochemical data that demonstrate attenuative processes
3. Biological microcosm studies that directly demonstrate degradation

As noted in the USEPA guidance document (USEPA, 1999a), the first line of evidence is most conclusive, and natural attenuation processes may be sufficiently characterized without performing all three steps.

With the exception of suspect results, monitoring well US-3D is the only location in the DSGA at which VOCs have historically been detected (Table 3-6). This was also the case during 2003. Thus, the focus of the monitored natural attenuation evaluation is on the groundwater in the DSGA in the vicinity of US-3D. At US-3D, vinyl chloride; cis-1,2-dichloroethene (cis-1,2-DCE); and trans-1,2-DCE were detected during all four quarters of 2003. These compounds were also detected at US-3D during the RI and PDI studies.

As described in the PDI groundwater report, these three compounds are typical products of degradation by reductive dechlorination of more highly chlorinated ethenes rather than directly disposed chemicals. In addition, under the reductive dechlorination pathway, each of these three compounds can be successively degraded to the complete dechlorination products ethene and chloride.

USEPA guidance (1999a) outlines a series of geochemical analyses that indirectly support the presence of biodegradation by anaerobic reductive dechlorination pathways. This guidance was used to develop the MNA monitoring program at HOD. That MNA program includes a number of these analyses, such as dissolved oxygen, nitrate, ferrous iron, manganese, sulfate, methane, redox potential, pH, alkalinity, and organic carbon. Table 3-7 compares results for MNA parameters at US-3D collected during the PDI (February and March 2000) and annual 2003 monitoring event with the USEPA (1999a) MNA guidance.

Microbial analyses are not a part of the current groundwater monitoring program at HOD, but based on the similarity of geochemical parameters at US-3D in 2003 compared to the PDI, it is expected that microbial activity at this well remains elevated at levels consistent with those measured during the PDI (RMT, 2000a). Geochemical parameters measured in the other DSGA wells (R-1D, US-1D, US-2D, US-4D, US-5D, W-3D, W-8D, and VW-3) also show generally reducing conditions throughout this aquifer in 2003. These wells do not, however, generally show elevated alkalinity and methane concentrations that are present in US-3D. Thus, while geochemical conditions throughout the DSGA are favorable for degradation of chlorinated ethenes by the reductive dechlorination pathway (USEPA, 1999a), the results in US-3D show a greater indication that anaerobic degradation is actively occurring at this well.

The concentrations of vinyl chloride and the two DCE isomers in US-3D were similar in each quarter of 2003 to the results from 2002, indicating that production and degradation of these compounds may be in a quasi steady-state condition, with slowly decreasing concentrations expected in the future. Thus, the results at US-3D over the last 2 years may represent a geochemical condition in the surrounding aquifer, where the migration of the three chloroethenes in the DSGA is balanced by their respective degradation rates. Historically, however, the concentrations of these compounds have shown greater variability. For instance, the concentrations of vinyl chloride appeared to decrease between 1993 and 2000, while the concentrations of the two DCE isomers appeared to increase over this same time period. As discussed in the 2002 annual report (RMT, 2003), the degradation rates for compounds with different amounts of chlorination may increase or decrease at individual wells owing to contrasts in the kinetics of the different chemical reactions that comprise reductive dechlorination. Alternatively, small shifts in the groundwater flow paths may transport groundwater of somewhat different chemistry to the monitoring well.

In addition to the USEPA guidance (1999a), other guidance documents were reviewed to assess the MNA data at the HOD Landfill. Evidence of the susceptibility of the two DCE isomers and vinyl chloride to the reductive dechlorination pathway is provided in a large compilation of referenced research titled "Natural Attenuation of Chlorinated Solvents in Groundwater: Principles and Practices" (ITRC, 1999). On page 9 of this guidance document, the observation that different degradation rates of chlorinated ethenes (including vinyl chloride) are found at some sites with the reductive dechlorination pathway is reported. On page 13 of this document, the presence of cis-1,2-DCE as the predominant DCE isomer (a trend observed at US-3D) is reported as a geochemical indicator of natural attenuation of chlorinated solvents (ITRC, 1999).

The analytical data from 2003 support the conclusion that, based on the available information, MNA is providing an effective remedy for exceedences in the DSGA.

3.4 Surface Water Monitoring

The surface water monitoring locations and the analytical parameters required for the quarterly monitoring program are presented on Figure 3-3 of this report. Two surface water sampling points are included in the monitoring program, SW-1 (upstream) and SW-2 (downstream). The annual summary report requirements for surface water monitoring were provided in Section 7 and Section 8 of the PSVP (RMT, 2001e). The annual evaluation of the surface monitoring program provides an interpretation of the four quarterly monitoring reports for 2003. The annual evaluation of the surface monitoring program includes a discussion of the surface water quality, exceedences from 2003, and surface water levels.

3.4.1 Surface Water Sampling

Fourth Quarter 2003

A sample of surface water was collected from SW-1 and SW-2 on November 19, 2003, for analysis of the quarterly parameter list, as provided in the FSAP (RMT, 2001b). An evaluation of the data quality of the analysis of the fourth quarter SW-2 sample is contained in Section 4 of this report. A copy of the analytical results is contained in Appendix H. No exceedences of the site-wide surface water protection standards were measured in the fourth quarter.

Annual Evaluation

Surface water analytical results and exceedence reports from the first through the third 2003 quarterly monitoring events were provided in those respective quarterly monitoring reports. The surface water analytical results from all four quarters of 2003 were evaluated and compared with the historical data for the HOD site. No exceedences of the site-wide surface water protection standards were measured in the any quarters of 2003 thereby showing compliance with the chemical-specific surface water standards specified in Table 11 of the ROD and in Table 2-2 of the PSVP.

3.4.2 Surface Water Level Measurements

Fourth Quarter 2003

On November 19, 2003, the staff gauges at both surface water monitoring points were observed to determine the surface water levels (*i.e.*, stream stage) within Sequoit Creek. The locations and elevations of the stream stage measurement points are summarized in Table 3-8.

Annual Evaluation

Surface water levels in 2003 were generally consistent with the shallow groundwater levels, with groundwater generally flowing toward Sequoit Creek, as described in Subsection 3.1.1. During the first quarter monitoring event, Sequoit Creek was completely frozen. Throughout 2003, the physical conditions of Sequoit Creek (*e.g.*, aquatic vegetation cover and occasional woody debris dams near SW-2) were similar to those previously observed.

3.5 Electronic Data Transfer

As required in Subsection 7.3 of the PSVP (RMT, 2001e), the groundwater sampling data collected during the fourth quarter of 2003 have been provided on disk (Appendix G). Using this Electronic Data Deliverable (EDD), the chemistry for measurements made in the field and the data from the analysis of the field samples are reported in electronic form.

Section 4
Fourth Quarter Data Quality Evaluation

4.1 Data Quality Evaluation

RMT evaluated the quality of the HOD Landfill groundwater monitoring data from the November 2003 sampling. Data validation was accomplished by comparing the quality assurance and quality control (QA/QC) results contained in the laboratory data packages with the requirements specified in the approved Quality Assurance Project Plan (RMT, 2001b); the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (USEPA, 1994); the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA, 1999b); the general guidelines published in SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (USEPA, 1996); EPA 600, Methods for Chemical Analysis of Water and Waste, EPA 600/4-79-020 with revisions (USEPA, 1979); and the Eastern Environmental Radiation Facility Radiochemistry Procedures Manual, EPA 520/5-84-006 (USEPA, 1984), where appropriate. Particular attention was paid to raw data, Chain-of-Custody Records, initial and continuing calibrations, blanks, laboratory control samples (LCSs), spike and duplicate analyses, and ICP serial dilution and ICP interference check sample results. The discussion that follows describes the QA/QC results and evaluation.

All analyses, except for the radioactive parameters, and endothall, were analyzed by Severn Trent Laboratories (STL), Inc., of Amherst, New York. The STL St. Louis laboratory performed the analyses for the radioactive parameters; STL Savannah laboratory performed the analyses for endothall.

4.2 Usability

RMT, Inc., collected a total of 17 water samples (14 groundwater, 2 surface waters, and 1 leachate) in November 2003. The samples were analyzed by STL, Inc., for the analytes listed in the approved QAPP. The analytes and the analytical methods used for analysis were as follows: volatile organic compounds (VOCs, CLP SOW OLCO2.1); organochlorine pesticides and PCBs (SVOCs, CLP SOW OLCO4.2); chlorophenoxy acid herbicides (Method 8151A, SW-846); semivolatile organic compounds (SW-846, Method 8270); endothall (EPA 600-548.1); carbamate pesticides (EPA 600-531.7); metals, (Methods 6010 and 6020, SW-846); the radioactive parameters gross alpha and gross beta (Method 900, EPA 520/5-84-006), tritium (Method 906, EPA 520/5-84-006), strontium-90 (Method 905, EPA 520/5-84-006), radium-226 (Method 9315, SW-846), and radium-228 (Method 9320, SW-846); and the inorganic indicator parameters (EPA 600 and Standard Methods). Additionally, field duplicates, trip blanks, matrix spikes/matrix spike duplicates (MSs/MSDs), and one atmospheric blank were collected and analyzed for quality control purposes.

The data quality objectives for the project were met, and the data are usable for the purposes defined in the approved workplan and QAPP. The procedures specified in the methods were implemented, and the data packages were found to contain all of the deliverables specified in the QAPP. Some samples for gross alpha and gross beta counting contained a mass residue that was greater than that required for drinking water (100 mg), but the sample residue was within the laboratory's calibration range. Therefore, for these samples, the laboratory was not able to achieve the standard laboratory minimum detectable activity.

Four analytes for semivolatile organics have laboratory Method Detection Limits (MDLs) that are greater than the target Quantitation Limits listed in the QAPP. The compounds are 1,2-dichlorobenzene; 1,4-dichlorobenzene; benzo(a)pyrene; and bis(2-ethylhexyl)phthalate. All MDLs are lower than the groundwater cleanup standards.

Laboratory and data validation qualifiers are defined in Table 4-1.

4.3 Sample Tracking

Laboratory reports received from STL were compared with shipping records to confirm that results were received for each sample that was shipped. All of the results for all sampling locations were received.

4.4 Holding Times and Sample Preservation

Required holding times were met. In several cases, the laboratory reanalyzed the sample for a particular parameter after the expiration of the holding time, because, the original value did not agree well with historical data. In these cases, the original analysis performed within the holding time was used, and the result for the analyte was qualified as estimated, "j." VOC analyses were performed within 14 days of sample collection. All samples were extracted for SVOCs and pesticide/PCBs, within 7 days of sample collection. The extracts were analyzed within 40 days of extraction. All samples were analyzed for carbamate pesticides within 28 days. Radionuclide analyses were performed within the 6-month time requirement. Mercury analysis for all samples was performed within 28 days of the sampling date. Other metals were analyzed for within the 6-month time requirement. Cyanide and alkalinity analyses were performed within 14 days of sample collection. BOD was analyzed for within the 48-hour holding time of sample collection. All TDS and sulfide analyses were performed within

7 days. Chloride, nitrogen species, fluoride, phosphate, sulfate, and TOC were analyzed for within 28 days of sample collection.

4.5 Instrument Performance Checks

Satisfactory gas chromatograph/mass spectrometer (GC/MS) instrument performance checks ensure adequate mass resolution, compound identification, and, to some degree, sensitivity. The analyses of the instrument performance check solutions were performed at the required frequency. The criteria established for instrument performance checks were met at all times.

4.6 Calibrations

Initial calibration establishes that the instrument is capable of acceptable performance at the beginning of the analytical sequence and that the calibration curve is linear. Continuing calibration verifies the calibration and evaluates daily instrument performance.

4.6.1 GC/MS Calibration

Initial calibrations containing target compounds and system monitoring compounds were performed at the required frequency and concentration levels. Initial calibrations of the GC/MS at five concentrations were performed after instrument performance check criteria were met and prior to the analysis of samples and blanks. Internal standards were added to all calibration standards and samples (including blanks and MSs/MSDs). The GC/MS calibration was verified every 12 hours with one mid-range standard.

The minimum relative response factor (RRF) criterion was met in the GC/MS analyses. The percent relative standard deviation (%RSD) of the calibration factors in the initial calibrations, and the %D values for the continuing calibrations were all acceptable.

4.6.2 GC and HPLC Calibration

Calibrations of GCs and high-performance liquid chromatograph (HPLC) instruments were performed according to the requirements in the analytical methods. For the analysis of the organochlorine pesticides/PCBs, the performance evaluation mixture (PEM) was analyzed at the frequency required in the method; and all method criteria were met. The %RSD of the calibration factors in the initial calibrations, and the %D values for the continuing calibrations were all acceptable. In a few cases, the %D values were greater than 15 percent; however, the average %D was <15 percent and these analytes were not detected in the samples, so there is no impact on the data.

Good peak resolution was achieved for all analyses; retention time (RT) and calibration factors were available for each peak. The RTs of target analytes and surrogate compounds were within the correct RT windows. Overall, acceptable instrument stability and performance were maintained for all instruments.

4.6.3 Inorganic Calibration

Initial calibrations and continuing calibration verifications, including initial and continuing calibration blanks, were performed at the required frequency and concentration level as specified in the methods. All calibration results were within QC acceptance criteria.

4.6.4 Calibrations of the Gas Proportional Counter and Liquid Scintillation Counter for Radionuclides

STL analyzed gross alpha and gross beta, radium-226/228, and strontium-90 radioactivity using a gas flow proportional counter and the beta activity of tritium by using a liquid scintillation counter following distillation. The laboratory calibrated the instruments using NIST-traceable standards. Americium-241 and thorium-230, tritium, and strontium-yttrium-90 were the isotopes in the calibration standards. The daily calibrations were performed using aqueous standards of Americium 241 and Strontium-90 for alpha and beta activity.

Alpha and beta particle activity was counted at the voltage plateau using gas flow proportional counting. During the detector efficiency calibration, the sensitivity of beta counting to the alpha activity was determined by alpha and beta cross-talk calibration, for which the effect was appropriately compensated.

The transmission factor calibration was performed for gross alpha and gross beta using standards of thorium-230 (alpha radiation) and strontium-90 (beta radiation) in order to account for the effect of sample solids on the counting efficiency and to correct for the self absorption of the radioactivity owing to solids (*i.e.*, counting efficiency vs. sample mass standard curves). In tritium analysis, a monthly quench curve was prepared to account for the sample solids effects. The counts were corrected for background radiation and counting efficiency.

Gross alpha–containing constituents were separated from the sample matrix by coprecipitating with barium sulfate/ferric hydroxide. The samples were then plated on counting planchettes prior to counting for alpha activity. On the other hand, for gross beta analysis, the water sample was evaporated prior to counting on the gas flow proportional counter. Tritium was counted in a liquid scintillation cocktail.

Overall, the instrument performance and stability for all radioactive analyses were acceptable.

4.7 Method Blanks

Method blanks were analyzed to assess potential sample contamination resulting from laboratory procedures. A method blank is carried through the same analytical steps (preparation and analysis) as the samples. In cases where there is no preparation step, such as for dissolved metals, the laboratory used the initial calibration blank (reagent water) as the method blank. Bis-2-ethyl hexyl phthalate (BEHP) was detected at levels below the reporting limit in two method blanks for semivolatiles. No samples were qualified because of those method blanks. Methylene chloride was detected in a few method blanks for volatile organics; no samples were qualified because methylene chloride was not detected in the samples. All other method blanks were free of target analytes.

4.8 Trip Blanks

To assess the potential for sample contamination during sample collection, shipment, and storage, trip blanks were analyzed for TCL VOCs during the quarterly monitoring. No target VOCs were detected in the trip blanks.

4.9 Atmospheric Blank

To check for procedural contamination at the site, which may cause sample contamination, one atmospheric blank was analyzed for VOCs and SVOCs. No target analytes were detected in the atmospheric blank.

4.10 Laboratory Control Samples

Laboratory control samples (LCSs) provide information about laboratory performance during the sample preparation and measurement performance on a clean water matrix. In cases where there is no preparation step, such as for dissolved metals, the laboratory used the initial calibration verification as the LCS. Analyte recoveries in the LCS were acceptable.

4.11 Matrix Spike/Matrix Spike Duplicates

A sample matrix spike consists of investigative sample water that is spiked with a group of target constituents representative of the method analytes and carried through the appropriate steps of the analysis. It provides information about the effects of the sample matrix on the sample preparation and measurement performance. The laboratory performed MSs/MSDs at the proper frequency for the project and the analytical methods. The percent recoveries and relative percent differences (RPDs) for the MSs/MDSs were acceptable for all of the organic analyses. All general chemistry parameters had acceptable results for the MS/MSD. In a couple of instances, the control limits were exceeded; however, none of these were significant. Several samples were spiked for MS/MSD purposes for the metals parameters. All metals parameters had acceptable results for the MSs/MSDs, with a few exceptions. In a few cases, the laboratory qualified sample results because of MS/MSD recoveries; however, in most cases, the recoveries were high and the analytes were not detected in the samples. No additional data validation qualifiers were added. Matrix spike and laboratory duplicate analyses that were performed for gross alpha, gross beta, and tritium, and a laboratory duplicate analysis that was performed for strontium-90 using samples from the HOD Landfill site were acceptable.

4.12 Surrogate Spikes

Laboratory performance on individual samples and blanks for the organic analyses was established by spiking all samples and blanks with surrogate compounds and then determining the surrogate spike recoveries. All surrogate recoveries were acceptable.

4.13 Blind Field Duplicate Results

Three blind field duplicate samples were collected: one sample each from locations US-04D, US-04S and SW-02. The precision between the blind field duplicate pairs was acceptable for target analytes that were reported at levels greater than 5 to 10 times the reporting limit. Results for dissolved sulfate showed greater than expected Relative Percent Difference (RPD) values. No data were qualified on the basis of the field duplicates. Greater variability is expected when reported values are near or less than the reporting limit, and these values should not be used to evaluate precision.

Table 4-2 shows the comparison of the reported analytes in the duplicate pairs. Relative percent difference values were calculated for only those pairs in which both reported results were above the reporting limit. Constituents that were less than the reporting limit, or constituents that were validated as nondetected on the basis of blank contamination, are not shown.

Section 5
Summary of Future Activities

Projected work for the next reporting period includes the following items:

- Monthly landfill inspections and gas and leachate monitoring will be performed in January, February, and March 2004.
- The 2004 first quarter leachate, groundwater, and surface water monitoring is scheduled for February 2004.
- A site inspection will be performed as part of each monitoring event.
- The sparking mechanism within the flare will be replaced (first quarter 2004).
- The flare will be modified if needed for proper operation in response to the decreased gas flow to the flare as a result of the gas-to-energy system going online.
- The methane gas sensors for the blower facility will be calibrated as needed.
- The pneumatic pumps will be pulled and cleaned as required to keep them operational.
- The leachate head level monitoring methods will be evaluated.
- The first quarter 2004 O&M progress report is scheduled for submittal by May 17, 2004.
- Additional record keeping due to the gas-to-energy system may be included, which would include recording the downtime of the system, including the blower/flare; the date and time of flare/blower alarms; the gas flow rates to the microturbines; and the gas flow rate to the flare. The actual information included in the O&M reports will be determined after communications with the USEPA.
- As part of the redevelopment of HOD Landfill into recreational and athletic fields during 2004, system operations and maintenance requirements may need to be modified. Modifications to systems in place and operation and monitoring procedures will be discussed and approved by the USEPA prior to implementation.

Section 6
References

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TABLES

Table 3-1
Ambient Leachate Elevations - Fourth Quarter 2003
HOD Landfill 2003 Annual Report

WELL	TOP OF FLANGE ELEVATION (feet, A.M.S.L.)	PUMP DRAWDOWN ELEVATION (feet, A.M.S.L.)(1)	FOURTH QUARTER 2003 (11/17/03)	
			DEPTH TO LEACHATE (feet)	LEACHATE ELEVATION (feet, A.M.S.L.)
GW 15	780.04	758	14.3	765.8
GW 16	782.33	758	19.2	763.1
GW 17	782.68	758	22.8	759.9
GW 18	792.60	758	26.6	766.1
GW 19	791.46	758	27.1	764.3
GW 20	788.76	758	19.3	769.5
GW 21	788.94	758	21.9	767.1
GW 22	785.01	758	12.3	772.7
GW 23	785.14	758	24.1	761.0
GW 24	788.36	758	16.0	772.3
GW 25	785.36	758	16.7	768.7
GW 26	780.00	758	16.5	763.5
GW 27	776.93	758	14.2	762.7
GW 28	779.36	758	14.3	765.1
GW 29	784.57	758	12.8	771.8
GW 30	778.14	761.5	15.8	762.3
GW 31	792.41	758	29.3	763.1
GW 32	788.33	758	25.8	762.6
GW 33	782.13	758	28.6	753.5
GW 34	782.83	758	20.4	762.5
GWF 2	792.55	758	24.8	767.7
GWF 3	791.87	758	34.4	757.5
GWF 4	791.50	758	33.1	758.4
GWF 5	784.42	758	13.5	770.9
GWF 8	791.50	758	12.6	778.9
GWF10	791.50	758	25.1	766.4
LP 1	774.54	759.3	14.0	760.5
LP 2	786.56	758	22.6	764.0
LP 3	777.91	758	11.5	766.4
LP 4	786.60	758	18.8	767.8
LP 8	792.61	758	27.4	765.3
LP 10	778.57	760.1	13.2	765.4
LP 11	786.13	761.8	17.0	769.2
MHE	790.79	758	27.5	763.3
MHW	789.80	758	30.7	759.1

Notes:

Updated by: PJT 2/04
Checked by: GMS 2/04

A.M.S.L. = above mean sea level.

NA = not applicable.

(1) The drawdown elevation is approximately 1 foot above the pump intake elevation owing to the operation of a float inside the pump. This elevation is conservative since the pumping level is higher in each well owing to the vacuum applied by the landfill gas extraction system.

Table 3-2
Leachate Drawdown Performance
Long-Term Monitoring
HOD Landfill 2003 Annual Report

LOCATION [1]	2/2001 LEACHATE ELEVATION (feet, A.M.S.L.)	REQUIRED ELEVATION CHANGE[1] (feet)	FOURTH QUARTER 2003 LEACHATE ELEVATION (feet, A.M.S.L.)	FOURTH QUARTER 2003 CHANGE IN LEACHATE ELEVATION SINCE 2/2001 (feet)[2]	FOURTH QUARTER 2003 PERCENT OF REQUIRED ELEVATION CHANGE SINCE 2/2001
Old Landfill					
GW 15	767.0	-6.0	765.8	-1.3	20.9%
GW 16	767.4	-6.4	763.1	-4.3	66.9%
GW 17	765.6	-4.6	759.9	-5.7	123.4%
GW 26	765.0	-4.0	763.5	-1.5	37.5%
GW 27	766.0	-5.0	762.7	-3.3	65.6%
GW 28	765.8	-4.8	765.1	-0.6	13.7%
GW 29	778.1	-17.1	771.8	-6.3	36.8%
GW 30	765.8	-4.8	762.3	-3.5	72.9%
LP 1	767.0	-6.0	760.5	-6.5	108.3%
LP 2	771.0	-10.0	763.95	-7.05	70.5%
LP 3	765.5	-4.5	766.4	0.9	0.0%
LP 4	773.2	-12.2	767.8	-5.4	44.2%
LP 10	767.1	-6.1	765.4	-1.7	28.5%
LP 11	770.9	-9.9	769.2	-1.7	17.3%
MHW	768.5	-7.5	759.1	-9.4	125.2%
New Landfill					
GW 18	763.6	-2.6	766.1	2.4	0.0%
GW 19	772.5	-11.5	764.3	-8.1	71.0%
GW 20	775.9	-14.9	769.5	-6.4	42.9%
GW 21	769.5	-8.5	767.1	-2.5	28.8%
GW 22	770.0	-9.0	772.7	2.7	0.0%
GW 23	774.7	-13.7	761.0	-13.7	99.9%
GW 24	779.9	-18.9	772.3	-7.5	40.0%
GW 25	781.9	-20.9	768.7	-13.2	63.3%
GW 31	764.0	-3.0	763.1	-0.9	30.6%
GW 32	761.5	-0.5	762.6	1.1	0.0%
GW 33	761.8	-0.8	753.5	-8.3	1036.3%
GW 34	761.8	-0.8	762.5	0.7	0.0%
GWF 2	766.3	-5.3	767.7	1.5	0.0%
GWF 3	767.2	-6.2	757.5	-9.7	155.9%
GWF 4	754.6	0.0	758.4	3.8	NA
GWF 5	768.1	-7.1	770.9	2.8	0.0%
GWF 8	779.0	-18.0	778.9	-0.1	0.4%
GWF 10	768.7	-7.6	766.4	-2.2	28.9%
LP 8	775.4	-14.4	765.3	-10.1	70.4%
MHE	762.1	-1.1	763.3	1.2	0.0%

Notes:

Updated by: PJT 2/04

A.M.S.L. = above mean sea level.

Checked by: GMS 2/04

NA = not applicable. The leachate elevation measured at GWF 4 in February 2001 was below the required elevation of 761.

(1) Required elevation change is based on the starting elevation measured prior to system startup (February 2001) to an elevation of 761 feet a.m.s.l. or the bottom of waste (if above 761 a.m.s.l.).

(2) Values are calculated by a formula and are rounded to one significant digit.

Table 3-3
Summary of Annual Leachate Sample Results and Applicable Leachate Standards
HOD Landfill 2003 Annual Report

CONSTITUENT	EFFLUENT STANDARDS FOR OFF-SITE DISPOSAL (mg/L unless otherwise indicated)[1]	ANNUAL LEACHATE SAMPLE RESULTS[2] (mg/L unless otherwise indicated)
Arsenic	0.25	<0.01
Barium	2.0	0.344
BOD	30[3]	10,700
Cadmium	0.15	<0.005
Chromium	1.0	<0.01
Copper	0.5	<0.010
Cyanide	<0.10	0.012
Fluoride	15.0	21.0
Iron	2.0	35.8
Lead	0.2	0.0103
Manganese	1.0	0.902
Mercury	0.003[4]	<0.0002
Nickel	1.0	0.0471
pH	6-9 standard units	8.12 standard units
Phenols	0.3	0.43
Silver	0.1	<0.01
Zinc	1.0	0.583
Total suspended solids (TSS)	15.0	<4.0

Notes:
(1) Derived from 35 IAC 304.124 through 304.125; concentrations for metals are total.
(2) The annual leachate sample was collected on November 21, 2003.
(3) As measured for at least eight quarters.
(4) Interpreted from 35 IAC 304.126.

Updated by: PT 2/04
Checked by: GMS 2/04

Table 3-4
Groundwater Level Measurements - Fourth Quarter 2003
HOD Landfill 2003 Annual Report

GROUNDWATER LEVEL MEASUREMENT POINT	TOP OF WELL ELEVATION (M.S.L. feet)	DEPTH TO WATER (feet)	GROUNDWATER ELEVATION (M.S.L. feet)	TOTAL WELL DEPTH (feet)	DATE OF GROUNDWATER LEVEL MEASUREMENT
G-102	773.53	10.81	762.72	25.10	11/18/03
G-14S	770.34	6.38	763.96	10.00	11/18/03
PZ-1	788.48	63.20	725.28	118.20	11/18/03
PZ-1U	766.41	NM	NM	27.00	11/18/03
PZ-2U	768.04	NM	NM	16.5	11/18/03
PZ-3U	766.27	3.20	763.07	39.36	11/18/03
PZ-4U	766.49	3.25	763.24	30.00	11/18/03
PZ-5U	771.11	7.71	763.40	37.0	11/18/03
PZ-6U	766.54	3.49	763.05	42.5	11/18/03
R-1D	774.68	50.54	724.14	101.76	11/18/03
US-1D	768.88	44.32	724.56	95.60	11/18/03
US-1S	768.69	3.51	765.18	12.41	11/18/03
US-2D	770.73	46.64	724.09	112.85	11/18/03
US-3D	769.72	45.14	724.58	83.15	11/18/03
US-3I	769.93	41.35	728.58	58.00	11/18/03
US-3S	770.48	8.00	762.48	22.50	11/18/03
US-4D	772.70	48.30	724.40	105.60	11/18/03
US-4S	773.67	10.93	762.74	25.31	11/18/03
US-5D	767.73	43.11	724.62	96.15	11/18/03
US-6D	770.09	45.68	724.41	85.24	11/18/03
US-6I	770.21	25.81	744.40	62.76	11/18/03
US-6S	769.90	6.94	762.96	43.00	11/18/03

Table 3-4 (continued)
Groundwater Level Measurements - Fourth Quarter 2003
HOD Landfill 2003 Annual Report

GROUNDWATER LEVEL MEASUREMENT POINT	TOP OF WELL ELEVATION (M.S.L. feet)	DEPTH TO WATER (feet)	GROUNDWATER ELEVATION (M.S.L. feet)	TOTAL WELL DEPTH (feet)	DATE OF GROUNDWATER LEVEL MEASUREMENT
W-2D	773.04	48.16	724.88	88.33	11/18/03
W-3D	765.93	41.52	724.41	80.35	11/18/03
W-3SA	766.54	3.76	762.78	15.64	11/18/03
W-3SB	766.81	3.97	762.84	29.57	11/18/03
W-4S	769.97	7.54	762.43	15.00	11/18/03
W-5S	773.49	10.50	762.99	14.34	11/18/03
W-6S	767.41	4.31	763.10	17.17	11/18/03
W-8D	768.14	43.54	724.60	96.15	11/18/03

Notes:
NM = not measured. Well was not accessible because of high water.
M.S.L. = mean sea level.

Updated by: DKJ 2/04
Checked by: GMS 2/04

Table 3-5
2003 Groundwater Exceedence Summary
HOD Landfill 2003 Annual Report

WELL	COMPOUND	SITE-WIDE GROUND-WATER PROTECTION STANDARD (µg/L)[1]	VALIDATED EXCEEDENCES (µg/L) 1ST QTR	2ND QTR	3RD QTR	4TH QTR	SUSPECT EXCEEDENCES (µg/L) 1ST QTR	2ND QTR	3RD QTR	4TH QTR
PZ-4U	Manganese (dissolved)	150	–	–	–	194	–	–	–	–
US-1D	Bis(2-ethylhexyl)phthalate	6	–	–	–	–	–	–	–	27 D
US-3D	cis-1,2-DCE	70	180	170	200	170	–	–	–	–
	Vinyl chloride	2	15 J	13 J	17 J	14 J	–	–	–	–
US-4S	Vinyl chloride	2	3 J	2 J	–	–	–	–	–	–
US-5D	Bis(2-ethylhexyl)phthalate	6	–	–	–	–	–	–	–	36 D
US-06D	Bis(2-ethylhexyl)phthalate	6	–	–	–	–	–	44 D	–	–
W-6S	Iron (dissolved)	5,000	10,900	–	–	12,800	–	–	–	–
	Manganese (dissolved)	150	272	340	392	887	–	–	–	–
	Sulfate (dissolved)	400	830	–	450	769	–	–	–	–
	Total dissolved solids (mg/L)	1,200	1,810	1,800	1,450	2,120	–	–	–	–
	Vinyl chloride	2	43	10	6 J	–	–	–	–	–
W-8D	Manganese (dissolved)	150	178	–	165	192	–	–	–	–

Notes:
– = the sample concentration is below the standard.
D = analyte value is from a diluted analysis.
J = reported value is less than the reporting limit, but greater than zero.
(1) Groundwater quality standards for the HOD site are listed in Table 2-1 of the PSVP (RMT, 2001e).

Updated by: PJT 2/04
Checked by: GMS 2/04

Table 3-6
Historical VOC Concentrations at US-3D
HOD Landfill 2003 Annual Report

DATE	CONCENTRATIONS (µg/L)		
	CIS-1,2-DICHLOROETHENE	TRANS-1,2-DICHLOROETHENE	VINYL CHLORIDE
May 1993	11 (total 1,2-dichloroethenes)		28
March 1994	18 (total 1,2-dichloroethenes)		35
February 2000	120	27	19
March 2000	120	25	19
February 2002	150 D	38 D	15
May 2002	180	44	16 J
August 2002	200	44	11 J
November 2002	170/180	43/46	18 J/17 J
February 2003	180	42	15 J
May 2003	170	41	13 J
August 2003	200	51	17 J
November 2003	170	45	14 J

Notes:
J = reported value is less than the reporting limit, but greater than zero.
D = analyte value is from a diluted analysis.

Updated by: PJT 2/04
Checked by: GMS 2/04

Table 3-7
Natural Attenuation Geochemical Parameters in the DSGA well US-3D
HOD Landfill 2003 Annual Report

ANALYSIS	INTERPRETATION	PDI RESULT	2003 RESULTS
Dissolved oxygen	<0.5 mg/L most conducive; >5 mg/L not tolerated by anaerobic organisms	≤1 mg/L	≤1 mg/L, except the fourth quarter (1.3 mg/L)
Nitrate	<1 mg/L indicative of no competition between nitrate and the reductive pathway	<0.05 mg/L	<2 mg/L
Iron (II)	>1 mg/L supportive of reductive pathway	>3 mg/L	>2.5 mg/L
Manganese	Increased concentrations over background suggestive of conditions conducive to reductive pathway[(1)]	>8 times background	2.4 to 5.2 times background
Sulfate	>20 mg/L suggestive of competition with reductive pathway	>40 mg/L	>50 mg/L
Methane	>0.5 mg/L indicative of strongly reducing conditions conducive to reductive pathway	0.32 mg/L	0.032 to 0.047 mg/L
Redox potential	<-100 mV makes the reductive pathway likely	-43 to –98 mV	-60 to –100 mV
PH	5 to 9 s. u. is optimal range for reductive pathway	7.1 to 7.4 s. u.	7.3 to 7.8 s. u.
Alkalinity	A doubling of alkalinity over background suggests increased microbial activity[(1)]	1.7 times background	1.8 to 2.7 times background
Organic carbon	>1 mg/L provides the energy need by microbes to live	2 mg/L	>1.2 mg/L except third quarter (<1 mg/L)

Notes:
(1) *Chemistry results from well US-5D, northwest of the landfill, are used for background comparisons.*

Updated by: PJT 2/04
Checked by: GMS 2/04

Table 3-8
Surface Water Level Measurements - Fourth Quarter 2003
HOD Landfill 2003 Annual Report

SURFACE WATER LEVEL MEASUREMENT POINT	COORDINATES		3.0-FOOT STAFF GAUGE REFERENCE ELEVATION (M.S.L. feet)	STAFF GAUGE READING (feet)	STREAM STAGE ELEVATION (M.S.L. feet)	DATE OF SURFACE WATER LEVEL MEASUREMENT
	NORTHING	EASTING				
SW-1	2,115,321.23	1,053,327.92	765.87	0.71	763.58	11/18/03
SW-2	2,116,562.10	1,050,723.00	762.99	1.28	761.27	11/18/03

Note:
M.S.L. = mean sea level.

Updated by: PJT 2/04
Checked by: GMS 2/04

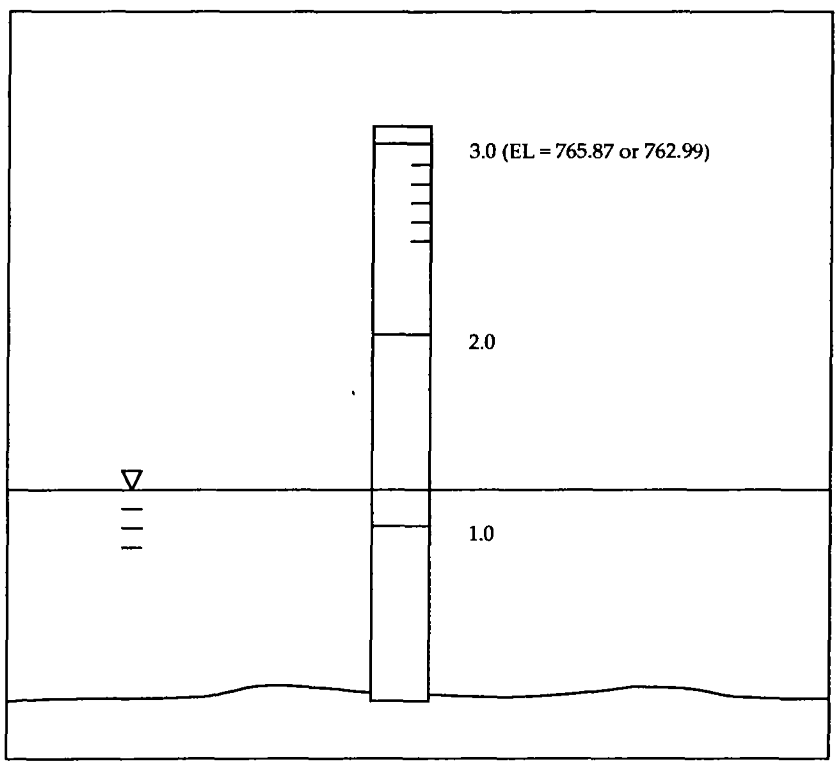


Table 4-1
Index of Laboratory and Data Validation Qualifiers - Fourth Quarter 2003
HOD Landfill 2003 Annual Report

Laboratory Qualifiers

INORGANIC DATA	
B	Analyte value is below the Quantitation Limit.
D	Analyte value is from a diluted analysis.
H	Analysis was performed past holding time.
J	Reported value is less than the reporting limit.
N	Spiked sample recovery was not within control limits.
U	Analyte was tested for, but was not detected; value indicates the detection limit.
ORGANIC DATA	
B	Analyte was present in the method blank.
D	Analyte value is from a diluted analysis.
E	Reported concentration exceeded the calibration range of the instrument.
J	Reported value is less than the reporting limit, but greater than zero.
P	The percent difference between the concentrations detected on each analytical column is greater than 25 percent.
N	Spiked sample recovery was not within control limits.
U	The compound was analyzed for, but not detected; the value indicates the detection limit.

Data Validation Qualifiers

j	When specific QC criteria are outside the established control limits, the reported concentration or the Quantitation Limit is approximate.
u	Analyte was present at less than 10 times the concentration in the associated method (B), trip (b), field (f), and/or laboratory storage blank for common laboratory contaminants, or at less than 5 times the blank concentration of other analytes, and is therefore qualified as nondetectable (u) according to USEPA data validation procedures (USEPA, 1994 and 1999).
uj	The material was analyzed for, but not detected. The associated numerical value is an estimated quantity.
r	Data unusable owing to laboratory QC results.
h	The technical holding time was exceeded.

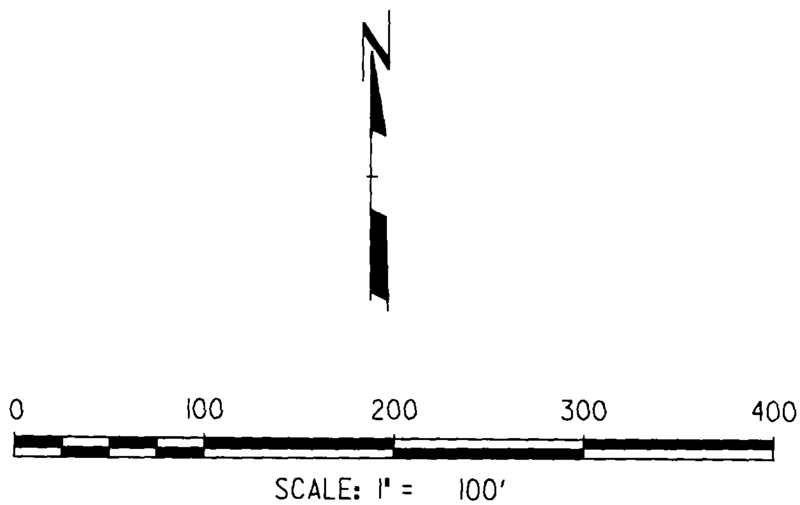
Table 4-2
Detected Parameters for the Blind Field Duplicate Pairs
HOD Landfill 2003 Annual Report

PARAMETER NAME	DL	UNITS	NOVEMBER 19, 2003		RPD
			SW-02	DUP	
Calcium, total	5,000	µg/L	58,000	57,400	1.04
Chloride	5	mg/L	123	124	0.81
Hardness as $CaCO_3$	5	mg/L	283	278	1.78
Iron, dissolved	100	µg/L	304	308	1.31
Magnesium, total	5,000	µg/L	33,500	32,800	2.11
Manganese, total	5	µg/L	72.1	71.2	1.26
Nitrogen, ammonia	0.01	mg/L	0.02	0.021	4.88
Solids, total dissolved	5	mg/L	460	456	0.873
Sulfate	1	mg/L	27.4	35.8	26.6
1,2-Dichloroethene, total	1	µg/L	1.4	1.4	0
PARAMETER NAME	**DL**	**UNITS**	**NOVEMBER 19, 2003**		**RPD**
			US-04D	**DUP**	
Alkalinity as $CaCO_3$	10	mg/L	437j	436	0.229
Boron, dissolved	100	µg/L	415	420	1.2
Calcium, dissolved	5,000	µg/L	33,100	33,100	0
Chloride, dissolved	1	mg/L	3	2.9	3.39
Fluoride, dissolved	0.5	mg/L	0.93	0.95	2.13
Hardness as $CaCO_3$	5	mg/L	170	170	0
Magnesium, dissolved	5,000	µg/L	21,200	21,300	0.471
Manganese, dissolved	5	µg/L	6.8	7	2.9
Nitrogen, ammonia	0.01	mg/L	0.77	0.77	0
Nitrogen, nitrite	0.05	mg/L	ND	0.098	--
Nitrogen, total Kjeldahl	0.1	mg/L	1	1.2	18.2
Phosphorus, Ortho	0.02	mg/L	0.2	0.18	10.5
Radium-226, dissolved	0.2	pCi/L	0.34J	ND	--
Solids, total dissolved	5	mg/L	280	334	17.6

Table 4-2 (continued)
Detected Parameters for the Blind Field Duplicate Pairs
HOD Landfill 2003 Annual Report

PARAMETER NAME	DL	UNITS	NOVEMBER 19, 2003		RPD
			US-04D	DUP	
Sulfate	5	mg/L	74.4	62.2	17.9
Sulfate, dissolved	5	mg/L	70.8	172	83.4
Total organic carbon as NPOC	1	mg/L	2.4	2.5	4.08
Tritium	96	pCi/L	65	49	28.1
Methane	8	μg/L	9.8	12	20.2
PARAMETER NAME	**DL**	**UNITS**	**NOVEMBER 19, 2003**		**RPD**
			US-04S	**DUP**	
Boron, dissolved	100	μg/L	231	233	0.862
Calcium, dissolved	5,000	μg/L	117,000	115,000	1.72
Chloride, dissolved	5	mg/L	180	181	0.554
Hardness as $CaCO_3$	5	mg/L	504	497	1.4
Iron, dissolved	100	μg/L	3,010	2,970	1.34
Magnesium, dissolved	5,000	μg/L	51,500	51,100	0.78
Manganese, dissolved	5	μg/L	81.4	80.8	0.74
Phenolics, total recoverable	0.005	mg/L	0.0052	ND	--
Radium-226, dissolved	0.21	pCi/L	1	0.77	26
Radium-228, dissolved	0.79	pCi/L	0.81J	ND	--
Solids, total dissolved	5	mg/L	773	809	4.55
Sulfate, dissolved	5	mg/L	80.6	77.9J	3.41
cis-1,2-Dichloroethene	2	μg/L	34	34D	0
Trans-1,2-dichloroethene	2	μg/L	2	2	0
Vinyl chloride	4	μg/L	0.9J	1	--

FIGURES



NO.	BY	DATE	REVISION	APP'D.
3.				
2.				
1.				

PROJECT: **WASTE MANAGEMENT OF ILLINOIS, INC.**
H. O. D. LANDFILL
2003 ANNUAL REPORT

SHEET TITLE:

LEACHATE LEVELS FOR JANUARY 2001

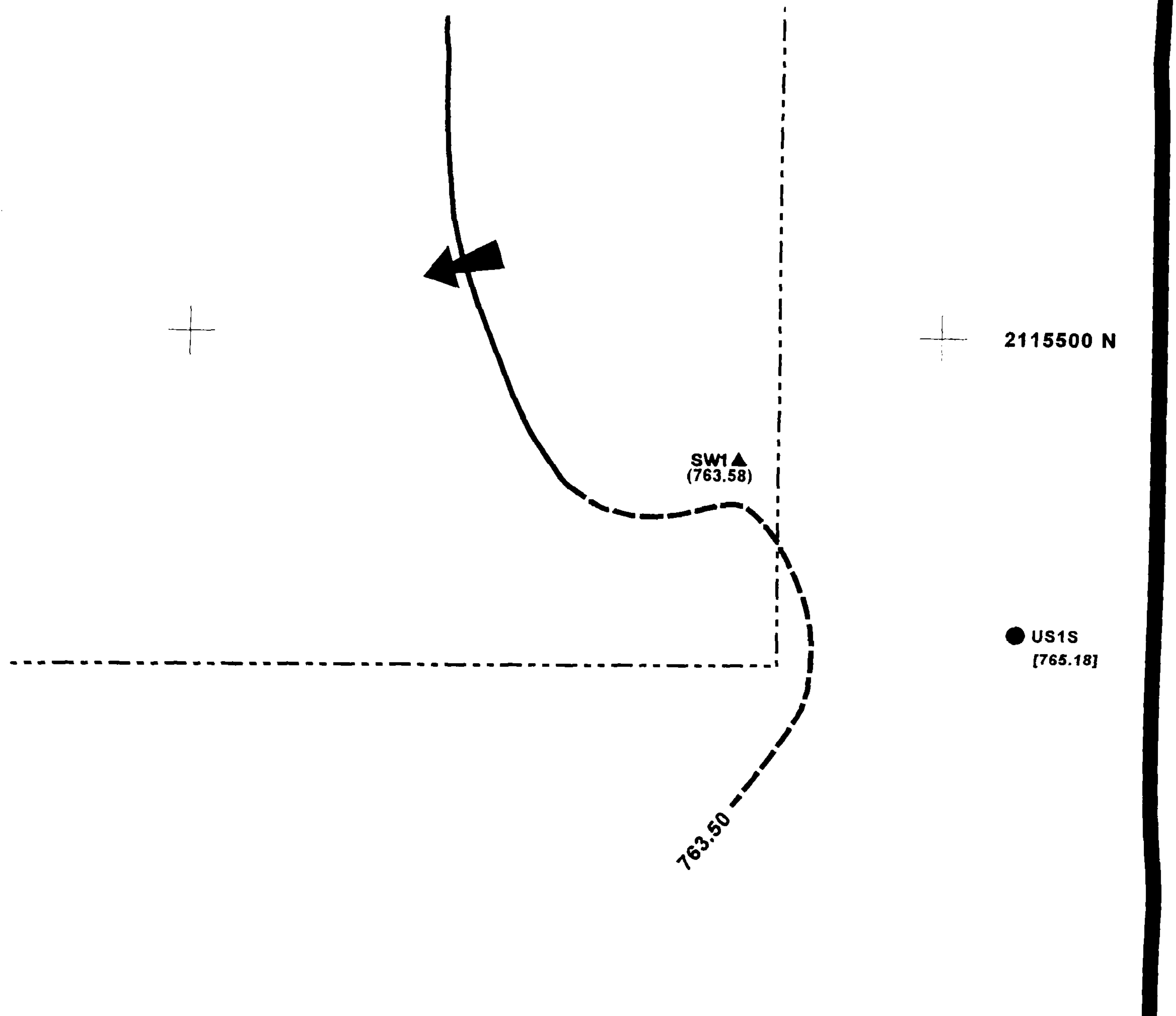
DRAWN BY: MEYERHOC	SCALE:	PROJ. NO. 5314.41\LEACHATE
CHECKED BY: PJT	1" = 100'	FILE NO. Jan2001 leach.plt
APPROVED BY: MJT	DATE PRINTED:	**FIGURE 3-1**
DATE: APRIL 2004	APR 30 2004	

WASTE MANAGEMENT

RMT INC.

744 Heartland Trail
Madison, WI 53717-1934

P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334



NO.	BY	DATE	REVISION	APP'D.
3.				
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1.				

PROJECT: **WASTE MANAGEMENT OF ILLINOIS, INC.**
H. O. D. LANDFILL
2003 ANNUAL REPORT

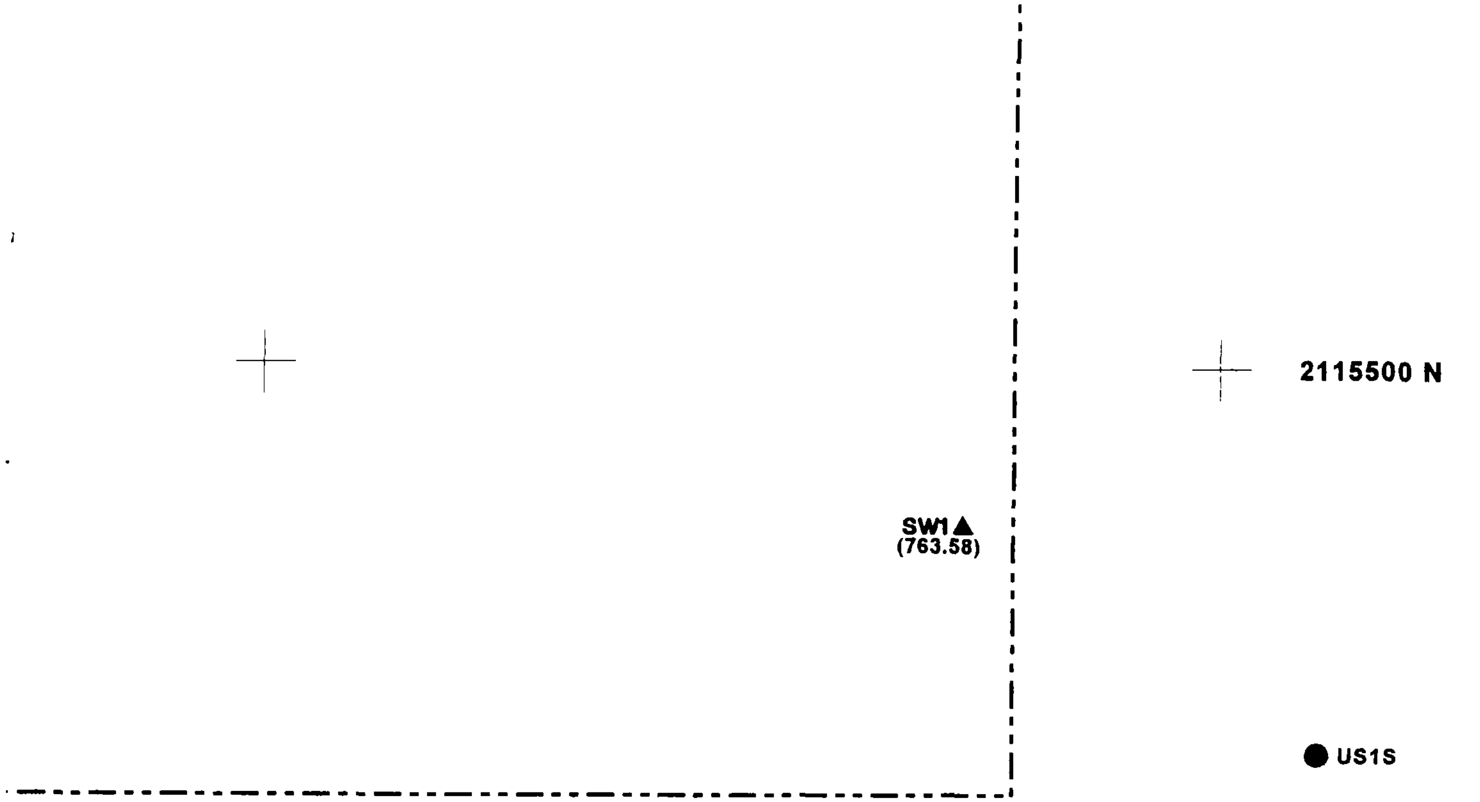
SHEET TITLE: **STABILIZED LEACHATE LEVELS, DRAWDOWN, AND SHALLOW WATER TABLE MAP FOR NOVEMBER 2003**

DRAWN BY: noldenr	SCALE: 1" = 100'	PROJ. NO.	5314.41\LEACHATE
CHECKED BY: MJT		FILE NO.	Nov2003 leach.plt
APPROVED BY: GJK	DATE PRINTED: APR 30 2004	**FIGURE 3-2A**	
DATE: APRIL 2004			

WASTE MANAGEMENT

RMT INC.

744 Heartland Trail
Madison, WI 53717-1934
P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334



NO.	BY	DATE	REVISION	APP'D.
3.				
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PROJECT: **WASTE MANAGEMENT OF ILLINOIS, INC.**
H. O. D. LANDFILL
2003 ANNUAL REPORT

SHEET TITLE: **LEACHATE DRAWDOWN**
JANUARY 2001 TO NOVEMBER 2003

DRAWN BY: noldenr	SCALE:	PROJ. NO. 5314.41\LEACHATE	
CHECKED BY: BJP	1" = 100'	FILE NO. Nov2003 ISO.plt	
APPROVED BY: MJT	DATE PRINTED: APR 3 0 2004	**FIGURE 3-2B**	
DATE: APRIL 2004			

WASTE MANAGEMENT

RMT INC.

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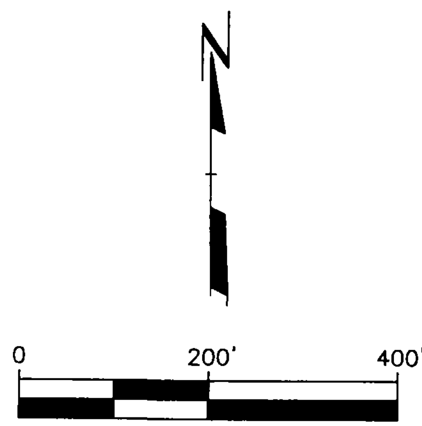
Madison, WI 53717-1934
P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

2116000N

2. WELLS SHOWN WITHIN THE LIMITS OF WASTE TO BE ABANDONED WILL REMAIN IN PLACE WITH AN AIR TIGHT CAP UNTIL THE GAS COLLECTION SYSTEM IS DEEMED ADEQUATE TO CONTROL AND COLLECT LANDFILL GAS.

2115500N



SCALE: 1"=200'

2115000N

2114500N

NO.	BY	DATE	REVISION	APP'D.
3.				
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PROJECT:

H.O.D. LANDFILL - FIELD SAMPLING PLAN
WASTE MANAGEMENT OF ILLINOIS, INC.

SHEET TITLE:

ENVIRONMENTAL MONITORING PLAN

DRAWN BY: REYZEKD	SCALE:	PROJ. NO. 05314.41	
CHECKED BY: PJT	1" = 200'	FILE NO. ENVIRMON.DWG	
APPROVED BY: MJT	DATE PRINTED: APR 3 0 2004	**FIGURE 3-3**	
DATE: APRIL 2004			

STE MANAGEMENT

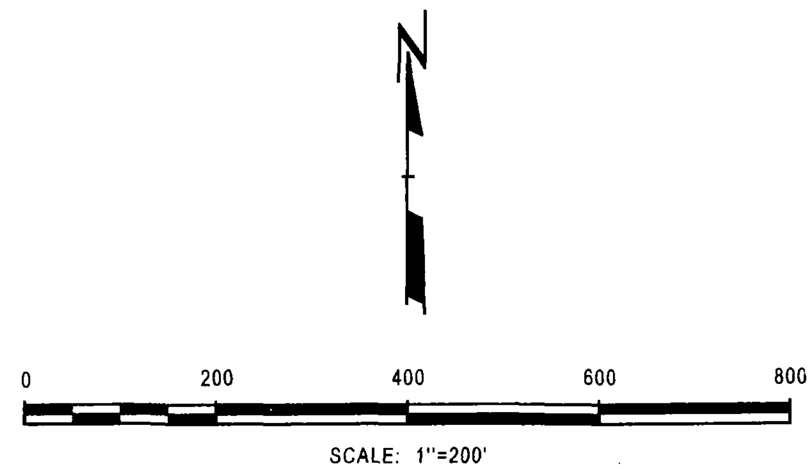
WM

RMT

744 Heartland Trail
Madison, WI 53717-1934
P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

2115500N

2115000N



2114500N

NO.	BY	DATE	REVISION	APP'D.
3.				
2.				
1.				

PROJECT:

H. O. D. LANDFILL
ANTIOCH, ILLINOIS

SHEET TITLE:

DSGA POTENTIOMETRIC SURFACE MAP
FIRST QUARTER 2003

DRAWN BY: MEYERHOC	SCALE: 1"=200'	PROJ. NO.	5314.41
CHECKED BY: THC		FILE NO.	QUARTER1 2003.PLT
APPROVED BY: PJT	DATE PRINTED: APR 30 2004	**FIGURE 3-4**	
DATE: APRIL 2004			

2114500N

1054000E

RMT INC.

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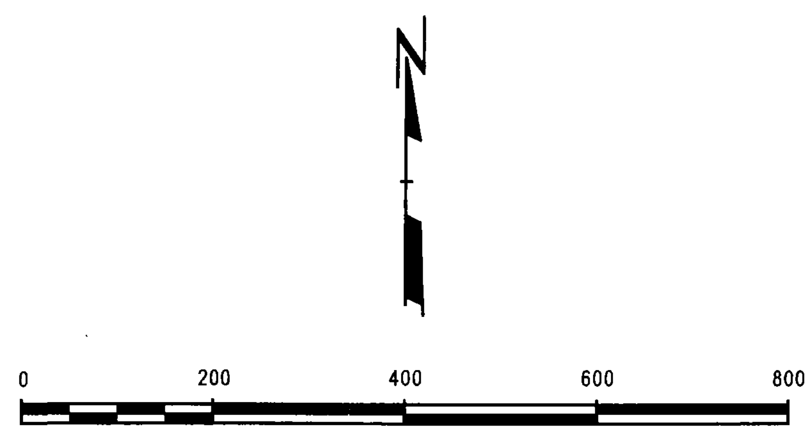
Phone: 608-831-4444
Fax: 608-831-3334

2115500N

2115000N



SCALE: 1"=200'

2114500N

2114500N

105400OE

NO.	BY	DATE	REVISION	APP'D.
3.				
2.				
1.				

PROJECT:

H. O. D. LANDFILL
ANTIOCH, ILLINOIS

SHEET TITLE:

DSGA POTENTIOMETRIC SURFACE MAP
SECOND QUARTER 2003

DRAWN BY: MEYERHOC	SCALE:		PROJ. NO. 5314.41
CHECKED BY: THC	1"=200'		FILE NO. QUARTER2 2003.PLT
APPROVED BY: PJT	DATE PRINTED:		**FIGURE 3-5**
DATE: APRIL 2004	APR 30 2004		

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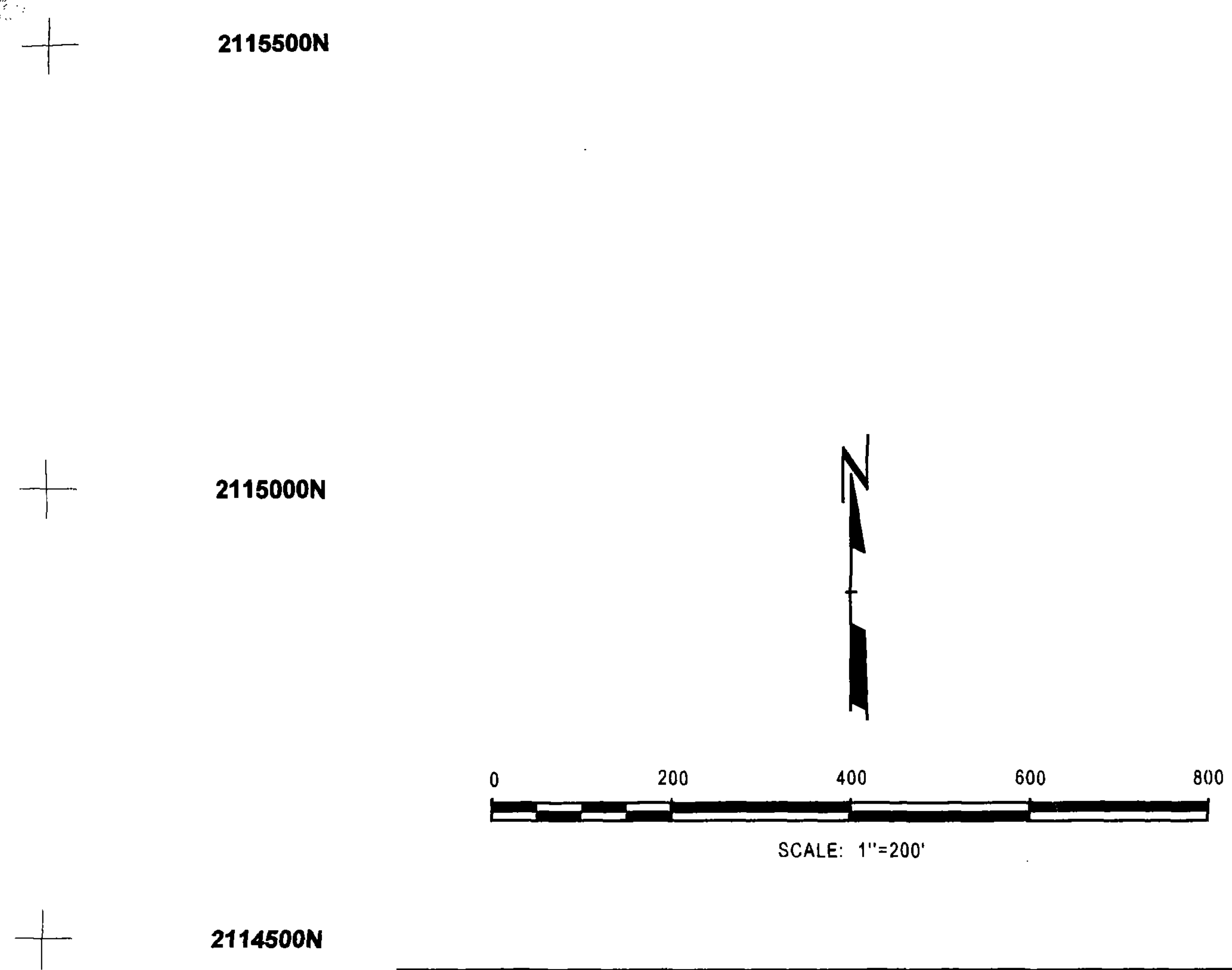

NO.	BY	DATE	REVISION	APP'D.
3.				
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1.				

PROJECT:

H. O. D. LANDFILL
ANTIOCH, ILLINOIS

SHEET TITLE:

DSGA POTENTIOMETRIC SURFACE MAP
THIRD QUARTER 2003

DRAWN BY: MEYERHOC	SCALE:	PROJ. NO.	5314.41
CHECKED BY: THC	1"=200'	FILE NO.	QUARTER3 2003.PLT
APPROVED BY: PJT	DATE PRINTED:	**FIGURE 3-6**	
DATE: APRIL 2004	APR 3 0 2004		

RMT INC.

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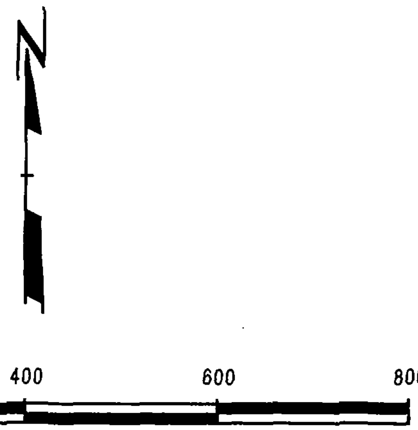
Phone: 608-831-4444
Fax: 608-831-3334

2115500N

2115000N



SCALE: 1"=200'

2114500N

2114500N

1054000E

NO.	BY	DATE	REVISION	APP'D.
3.				
2.				
1.				

PROJECT:
H. O. D. LANDFILL
ANTIOCH, ILLINOIS

SHEET TITLE:
DSGA POTENTIOMETRIC SURFACE MAP
FOURTH QUARTER 2003

DRAWN BY: noldenr	SCALE: 1"=200'	PROJ. NO. 5314.41
CHECKED BY: THC		FILE NO. QUARTER4 2003.PLT
APPROVED BY: PJT	DATE PRINTED: APR 30 2004	**FIGURE 3-7**
DATE: APRIL 2004		

RMT INC.

744 Heartland Trail
Madison, WI 53717-1934

P.O. Box 8923 53708-8923
Phone: 608-831-4444
Fax: 608-831-3334

Appendix A
Inspection and Maintenance Reports - Fourth Quarter 2003

Inspection Reports

2

FACILITY INSPECTION REPORT
H.O.D. LANDFILL
ANTIOCH, ILLINOIS

NOTE: Inspector using this form shall be familiar with Section 4 of the O&M Plan. Mark the location of any potential problems on the attached site map regardless if maintenance is required.

DATE: 10/6/03 INSPECTOR: Jason Schoephoester

TEMPERATURE/WEATHER: Sunny, mid 50's

GROUND CONDITIONS: Dry

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance
Final Cover			
1. Vegetation	weedy, few bare spots	☒	☐
2. Erosion	Recently repaired	☒	☐
3. Burrowing		☒	☐
4. Settlement		☒	☐
5. Leachate seeps		☒	☐
6. Other		☐	☐

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance

<u>Groundwater Wells/Gas Probes</u>

Describe below (see next page) the nature of any damage, deterioration, or vandalism observed and required maintenance. At a minimum, the following components of each well and probe shall be inspected: (1) protective casing; (2) well stick-up, cap, and conditions inside protective casing; (3) surface seal; (4) well I.D. label; (5) locks.

		Adequate	Requires Maintenance
1.	Identify well/probe number and problems observed, if any. Need Abus locks for probes GP-3, GP-4A, and GP-5A.	☐	☒

<u>Extraction Wells/Condensate Sumps</u>

Inspect well assemblies for loose bolts, cracks in pipes, air or liquid leaks in pipes, broken valve controls, evidence of differential settlement (such as stretching of the flex hose), or other evidence of integrity failure. Describe the nature of any damage, deterioration, or vandalism observed and required maintenance. Identify the extraction well number for problems observed, if any.

		Adequate	Requires Maintenance
1.	Differential settlement	☒	☐
2.	Hardware, locks, pipes, and valves Need to add extensions to vault boxes at GW-32, LP-8, and GW-21.	☐	☒
3.	Pump/Sump	☒	☐
4.	Leaks	☒	☐
5.	Other	☐	☐

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance
Extraction System Piping			
1. Header isolation valves		☒	☐
2. Condensate surging		☒	☐
3. Settlement		☒	☐
4. Other		☐	☐
Blower Facility			
1. Piping, fittings, valves, seals		☒	☐
2. Blower	Grease blower next month	☒	☐
3. Exhaust fan		☒	☐
4. Gas sensor		☒	☐
5. Other	Preventative maintenance on compressor and dryer to be scheduled. Replaced recorder ribbon.	☒	☐
Flare			
1. Flame arrestor		☒	☐

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance
2. Igniter		☒	☐
3. Installation		☒	☐
4. Solenoids		☒	☐
5. Other		☐	☐
Fencing and Signs			
1. Fencing		☒	☐
2. Gates and locks		☒	☐
3. Signs		☒	☐
4. Other		☐	☐
Access Road			
1. Accessibility		☒	☐
2. Other		☐	☐

FACILITY INSPECTION REPORT
H.O.D. LANDFILL
ANTIOCH, ILLINOIS

NOTE: Inspector using this form shall be familiar with Section 4 of the O&M Plan. Mark the location of any potential problems on the attached site map regardless if maintenance is required.

DATE: 11/10 - 11/11/03 INSPECTOR: Jason Schoephoerster

TEMPERATURE/WEATHER: P. Cloudy - cloudy, 30's - 50's °F

GROUND CONDITIONS: Moist, soft in spots

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance
Final Cover			
1. Vegetation	weedy, bare in spots	☒	☐
2. Erosion		☒	☐
3. Burrowing		☒	☐
4. Settlement		☒	☐
5. Leachate seeps		☒	☐
6. Other		☐	☐

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance

Groundwater Wells Gas Probes

Describe below (see next page) the nature of any damage, deterioration, or vandalism observed and required maintenance. At a minimum, the following components of each well and probe shall be inspected: (1) protective casing; (2) well stick-up, cap, and conditions inside protective casing; (3) surface seal; (4) well I.D. label; (5) locks.

Item	Comments/Observations	Adequate	Requires Maintenance
1. Identify well probe number and problems observed, if any.	Need Abus locks for GP-3, GP-4A and GP-5A	☐	☒

Extraction Wells Condensate Sumps

Inspect well assemblies for loose bolts, cracks in pipes, air or liquid leaks in pipes, broken valve controls, evidence of differential settlement (such as stretching of the flex hose), or other evidence of integrity failure. Describe the nature of any damage, deterioration, or vandalism observed and required maintenance. Identify the extraction well number for problems observed, if any.

Item	Comments/Observations	Adequate	Requires Maintenance
1. Differential settlement	Extend flex hoses @ GW-34, GW-31 and MHE Added vault box extension to GW-32	☐	☒
2. Hardware, locks, pipes, and valves	Repair Valve @ GW-21	☒	☐
3. Pump/Sump	Pull + Check several leachate pumps	☐	☒
4. Leaks	Siliconed well head @ GWF-10, GW-32	☒	☐
5. Other		☐	☐

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance
Extraction System Piping			
1. Header isolation valves		☒	☐
2. Condensate surging		☒	☐
3. Settlement		☒	☐
4. Other		☐	☐
Blower Facility			
1. Piping, fittings, valves, seals		☒	☐
2. Blower		☒	☐
3. Exhaust fan		☒	☐
4. *Gas sensor*		☒	☐
5. Other		☐	☐
Flare			
1. Flame arrestor		☒	☐

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance
2. Igniter		☒	☐
3. Installation		☒	☐
4. Solenoids		☒	☐
5. Other		☐	☐
<u>Fencing and Signs</u>			
1. Fencing		☒	☐
2. Gates and locks		☒	☐
3. Signs		☒	☐
4. Other		☐	☐
<u>Access Road</u>			
1. Accessibility		☒	☐
2. Other		☐	☐

FACILITY INSPECTION REPORT
H.O.D. LANDFILL
ANTIOCH, ILLINOIS

NOTE: Inspector using this form shall be familiar with Section 4 of the O&M Plan. Mark the location of any potential problems on the attached site map regardless if maintenance is required.

DATE: 12/16/03 INSPECTOR: Jason Schoephoester

TEMPERATURE/WEATHER: Cloudy, Breezy, snow showers, mid 30's dropping into 20's °F

GROUND CONDITIONS: Moist to wet, trace snow, standing water/ice in areas.

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance
Final Cover			
1. Vegetation	Sparse in some areas	☒	☐
2. Erosion		☒	☐
3. Burrowing		☒	☐
4. Settlement		☒	☐
5. Leachate seeps		☒	☐
6. Other		☐	☐

11

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance

Groundwater Wells/Gas Probes

Describe below (see next page) the nature of any damage, deterioration, or vandalism observed and required maintenance. At a minimum, the following components of each well and probe shall be inspected: (1) protective casing; (2) well stick-up, cap, and conditions inside protective casing; (3) surface seal; (4) well I.D. label; (5) locks.

		Adequate	Requires Maintenance
1.	Identify well/probe number and problems observed, if any. Need Abus locks from WM for GP-3, 4A, and 5A	☐	☒

Extraction Wells/Condensate Sumps

Inspect well assemblies for loose bolts, cracks in pipes, air or liquid leaks in pipes, broken valve controls, evidence of differential settlement (such as stretching of the flex hose), or other evidence of integrity failure. Describe the nature of any damage, deterioration, or vandalism observed and required maintenance. Identify the extraction well number for problems observed, if any.

		Adequate	Requires Maintenance
1.	Differential settlement Need vault extensions at GW-2', GWF-5, and GW-20 in near future.	☒	☐
2.	Hardware, locks, pipes, and valves	☒	☐
3.	Pump/Sump Trip planned to reinstall pump at GW-29 in next week.	☐	☒
4.	Leaks	☒	☐
5.	Other	☐	☐

12

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance
Extraction System Piping			
1. Header isolation valves		☒	☐
2. Condensate surging		☒	☐
3. Settlement		☒	☐
4. Other		☐	☐
Blower Facility			
1. Piping, fittings, valves, seals		☒	☐
2. Blower		☒	☐
3. Exhaust fan		☒	☐
4. Gas sensor	Re-calibrate sensor in compressor room and air drying room	☐	☒
5. Other		☐	☐
Flare			
1. Flame arrestor		☒	☐

B

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance
2.	Igniter Will contact LFGTE regarding purchasing spare igniter unit	☒	☐
3.	Installation	☒	☐
4.	Solenoids	☒	☐
5.	Other	☐	☐

Fencing and Signs

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance
1.	Fencing	☒	☐
2.	Gates and locks	☒	☐
3.	Signs	☒	☐
4.	Other	☐	☐

Access Road

ITEM	COMMENTS/OBSERVATIONS	Adequate	Requires Maintenance
1.	Accessibility	☒	☐
2.	Other	☐	☐

PROJECT/PROPOSAL NAME/LOCATION:		PROJECT/PROPOSAL NO.
SUBJECT: HOD LF - Start-up		5314.37
PREPARED BY: JRS	DATE: 12/17/03	FINAL ☐
CHECKED BY:	DATE:	REVISION ☐

- Attempted to set recorder to record 3rd channel on LFG+E panel. Got it recording, but is off → reading 265 cfm and should be reading ~170 cfm.

- Compressor and dryer running, w/o turbines - recorder is showing ~200 cfm (valve in dryer building 100% open)

To flare: 178 cfm
+2.5" vac.
58.8% CH_4
1.2% O_2

To compressor (in dryer building): +.5"
61% CH_4
0% O_2

- W/12 turbines started:

To flare: +1.0" 110 cfm
53.8% CH_4
1.4% O_2

To compressor: -3.0"
53.0% CH_4
1.2% O_2

- after ~1 hour + w/valve in dryer building @ 50% open + valve in blower building 100% open

To flare: 95 cfm
990°F
+0.60"
50.8% CH_4
1.6% O_2

To compressor: -3.8"
51.6% CH_4
1.4% O_2

Monitoring Reports

Landfill Gas/Leachate Monitoring
H.O.D. Landfill
Antioch, Illinois

Person sampling: Jason Schoephoester   Date: 10/6/03

Ambient temperature: 56 °F

Barometric pressure: 30.1 in. Hg

Trend in barometric pressure: Steady

Weather conditions: Sunny

Ground conditions: Dry

Gas/O_2 meter model: Landtec GA-90   Serial #: RMT 1049

Date last calibrated: 10/6/03

Notes: Flow was reduced on 10/3/03 in anticipation for micro-turbine Start-up activities on 10/6/03.

BLOWER/FLARE DATA

ITEM (UNITS)	INITIAL READINGS	POST ADJUSTMENTS
Flow rate (scfm)	145	
Combustion temperature (°F)	1275	
Blower inlet pressure (in H_2O)	-4.5	
Blower outlet pressure (in H_2O)	+1.8	
Blower building valve setting	2 notches up (≈20°)	
Gas inlet temperature (°F)	70	
% CH_4	58.4	
% CO_2	32.3	
% O_2	1.4	
% Balance gas		

LEACHATE LOADOUT FACILITY DATA

Leachate tank level	4.8	Feet
Pump operation (hours)		Hours
Leachate pumped (gallons)		Total gallons
Compressor pressure	115	PSI
Compressor temperature	168	°F

Notes: Took manifests back to office

JS

Landfill Gas/Leachate Monitoring
H.O.D. Landfill
Antioch, Illinois

Person sampling: Jason Schoephoester Date: 11/10+11/03

Ambient temperature: 40°F °F

Barometric pressure: 30.1 in. Hg

Trend in barometric pressure: Falling

Weather conditions: Partly Cloudy - Cloudy

Ground conditions: Moist

Gas/O2 meter model: Landtec GA-90 Serial #: RMT 1049

Date last calibrated: 11/10/03

Notes:
- Leachate pumps off 11/10/03 AM.
- Leachate level readings taken 11/17/03.
- Pumps turned on 11/17/03 PM.

BLOWER/FLARE DATA		
ITEM (UNITS)	INITIAL READINGS	POST ADJUSTMENTS
Flow rate (scfm)	321	290
Combustion temperature (°F)	1580	1610
Blower inlet pressure (in H_2O)	-24"	-23"
Blower outlet pressure (in H_2O)	+7"	+6"
Blower building valve setting	~40% open	~30% open
Gas inlet temperature (°F)	60	62
% CH_4	47.0	51.0
% CO_2	28.8	28.9
% O_2	2.4	1.5
% Balance gas		

LEACHATE LOADOUT FACILITY DATA		
Leachate tank level	6.5	Feet
Pump operation (hours)		Hours
Leachate pumped (gallons)		Total gallons
Compressor pressure	115	PSI
Compressor temperature	166	°F

Notes:

8

Landfill Gas/Leachate Monitoring
H.O.D. Landfill
Antioch, Illinois

WELL FIELD DATA 11/10 - 11/11/03

LOCATION	WELL-SIDE PRESSURE[1]		HEADER SIDE PRESSURE[1]		% CH_4	% O_2	% CO_2	% BAL.	TEMP.	ORIFICE PLATE DP[1]		INITIAL VALVE ~~%~~ Turns OPEN		LEACHATE PUMP CYCLE #	LEACHATE LEVEL ~~ABOVE 957 FT~~
	I	P	I	P						I	P	I	P		
GWF-2	-21	NC	-21.5		51.0	0.0	32.4		70	2.0	NC	7	7	337716	
GWF-3	-21	NC	-21.5		60.0	0.4	34.0		76	0.17	0.17	5.5	6.75	011265	
GWF-4	-20.5	NC	-21.5		56.8	0.2	37.0		88	NA	NA	3.25	4	000259	
GWF-5	-21	-22	-22		64.3	1.0	34.2		64	0.18	0.20	4.5	6.0	1278539	
GWF-8	-21.5	-20	-21.5		68.3	0.1	33.5		80	0.70	0.70	5	7	1094976	
GWF-10	-5	0	-22		6.5	18.6	3.7		50	0.28	0	.25	0	324318	
GW-15	-5	NC	-22		3.2	6.1	13.6		42	0.15	0.15	0	0	470889	
GW-16	-19.5	NC	-22.5		42.3	0.3	21.0		50	1.7	NC	1.5	NC	688185	
GW-17	-2.0	-1.0	-22.5		24.7	8.1	14.8		50	NA	NA	.25	1/8	120720	
GW-18	-21	-21.5	-22		56.4	1.0	35.3		70	0.80	0.85	2	2.5	145413	
GW-19	-19	NC	-21		56.5	3.0	26.2		68	.20	NC	.75	NC	454744	
GW-20	-20	-20	-21		60.5	0.9	37.6		68	0.70	0.90	2.5	3.5	073984	
GW-21	-21	-17	NA		2.0	19.9	1.3		50	.25	.10	.5	0	2293949	
GW-22	-6.5	-1.0	-20		25.5	11.7	16.6		64	NA	NA	2	1.5	2311644	
GW-23	-20	-15	-21.5		47.4	6.6	20.8		56	0.02	0.02	.5	.25	1702976	
GW-24	-21.5	-21.5	-21.5		63.5	1.8	27.9		70	0.07	0.08	5.5	6.5	1630025	
GW-25	+25	-3	-22		74.3	0.0	26.4		54	NA	NA	0	.5	3559245	

Note: [1] I = initial reading; P = post adjustments; NC = no change.

NA = Broken Sample ports - will be replaced.

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Landfill Gas/Leachate Monitoring
H.O.D. Landfill
Antioch, Illinois

WELL FIELD DATA

LOCATION	WELL SIDE PRESSURE⁽¹⁾ I	WELL SIDE PRESSURE⁽¹⁾ P	HEADER SIDE PRESSURE⁽¹⁾ I	HEADER SIDE PRESSURE⁽¹⁾ P	% CH_4	% O_2	% CO_2	% BAL.	TEMP.	ORIFICE PLATE DP⁽¹⁾ I	ORIFICE PLATE DP⁽¹⁾ P	INITIAL VALVE ~~%~~ Turns OPEN I	INITIAL VALVE ~~%~~ Turns OPEN P	LEACHATE PUMP CYCLE #	LEACHATE LEVEL ~~[illegible]~~
GW 26	0	NC	-24		30.6	0.3	27.0		94	0	NC	0	NC	497568	
GW 27	0	NC	-23		10.0	0.0	20.0		64	0	NC	0	NC	1739801	
GW 28	-.50	-.40	-24		12.3	1.6	20.8		78	0.05	0.05	.50	.25	1695125	
GW 29	8	-5	22.5		13.6	3.8	14.6		60	0.09	0.08	.75	1/8	1072669	
GW 30	-3.5	NC	-23		27.4	2.1	22.7		64	1.4	NC	.50	NC	1206283	
GW 31	-21	-21	-21.5		40.3	3.4	25.4		58	3.6	3.5	2.5	1.5	186053	
GW 32	-21	-20.5	-21		40.0	0.9	29.3		72	0.8	0.8	2.5	2	515162	
GW 33	-20	-20.5	-21.5		58.8	1.0	36.4		52	2.3	2.8	2.75	3.5	000252	
GW 34	-19	-20.5	-22		57.3	1.9	35.5		70	1.4	2.0	2	2.5	904991	
LP1	-2	NC	-22.5		9.4	18.0	2.9		50	0.08	NC	1/8	NC	898621	
LP2	-20	NC	-20.5		54.9	3.6	26.9		50	NA	NA	.25	NC	609918	
LP3	-20	NC	-22.5		51.6	3.2	22.9		32	0.25	NC	1/8	NC	633378	
LP4	-22	-22	-22		66.4	0.2	30.7		60	0.10	0.20	.50	1.5	357636	
LP8	-21.5	-21.5	-21.5		65.4	0.2	34.9		68	0.40	0.45	1.5	3	603692	
LP10	-7	NC	-23		42.5	0.5	23.3		60	0.17	NC	.50	NC	045011	
LP11	-2.2	NC	-23		44.7	0.6	26.8		60	NA	NA	1.0	NC	160932	
MHE	-20.5	-18	-22		43.4	3.6	26.1		62	1.0	0.36	1.75	1.0	823625	
MHW	-0.5	NC	-22		0.0	20.5	0.1		56	0	NC	0	NC	431192	

Note. ⁽¹⁾ I = initial reading; P = post adjustments; NC = no change.

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NA = Broken Sample ports - will be replaced.

Landfill Gas/Leachate Monitoring
H.O.D. Landfill
Antioch, Illinois

GAS PROBE DATA 11/10 – 11/11/03

LOCATION	PRESSURE(1)	% CH_4	LEL CH_4	% O_2	% CO_2	% BAL.
GP3	0.0	0	0	20.1	0.1	
GP4A	0.0	0	0	15.4	1.8	
GP5A	0.0	0	0	20.4	0.2	
GP6	+0.22	0	0	4.6	3.3	
GP7	-0.03	0	0	19.9	1.3	
GP8	0.0	0	0	18.6	1.3	

Condensate sump cycles

CS-1 944864
CS-2 285236
CS-3 219001
CS-4 306455

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Landfill Gas/Leachate Monitoring
H.O.D. Landfill
Antioch, Illinois

WELL FIELD DATA 11/17/03

LOCATION	WELL-SIDE PRESSURE[1]		HEADER SIDE PRESSURE[1]		% CH_4	% O_2	% CO_2	% BAL.	TEMP.	ORIFICE PLATE DP[1]		INITIAL VALVE ~~%~~ Turns OPEN		LEACHATE PUMP CYCLE #	LEACHATE LEVEL DTL
	I	P	I	P						I	P	I	P		
GWF-2					36.5	0.6	29.2					7	2		24.81
GWF-3					53.2	0.3	35.0					6.75	NC		34.35
GWF-4					46.8	0.3	35.9					4	NC		33.13
GWF-5					51.1	3.8	28.4					6	NC		13.53
GWF-8					62.8	0.6	33.8					7	8		12.58
GWF-10					61.9	0.5	36.9					0	.25		25.06
GW-15					2.9	10.1	10.4					0	NC		14.26
GW-16					38.1	0.4	22.0					1.5	.50		19.20
GW-17					18.4	9.8	11.8					1/8	0		22.75
GW-18					47.9	1.1	33.5					2.5	NC		26.55
GW-19					51.6	2.5	28.9					.75	NC		27.14
GW-20					55.6	1.3	36.3					3.5	NC		19.28
GW-21					61.3	0.0	39.0					0	.25		21.89
GW-22					56.6	1.0	42.1					1.5	NC		12.32
GW-23					43.8	7.0	20.0					.25	1/8		24.12
GW-24					59.7	1.4	28.9					6.5	7		16.04
GW-25					0	20.5	0.1					.5	1/8		16.71

Note: [1] I = initial reading; P = post adjustments; NC = no change.

Landfill Gas/Leachate Monitoring
H.O.D. Landfill
Antioch, Illinois

WELL FIELD DATA 11/17/03

7 turns

LOCATION	WELL-SIDE PRESSURE(1) I	WELL-SIDE PRESSURE(1) P	HEADER SIDE PRESSURE(1) I	HEADER SIDE PRESSURE(1) P	% CH_4	% O_2	% CO_2	% BAL.	TEMP.	ORIFICE PLATE DP(1) I	ORIFICE PLATE DP(1) P	INITIAL VALVE % OPEN I	INITIAL VALVE % OPEN P	LEACHATE PUMP CYCLE #	LEACHATE LEVEL DTL
GW 26					23.0	0.8	25.6					0	NC		16.50
GW 27					21.6	1.0	21.3					0	NC		14.20
GW 28					9.8	2.3	20.3					.25	↓1/8		14.25
GW 29					3.0	16.8	3.7					1/8	0		12.77
GW 30					23.8	2.7	21.5					.50	.25		15.83
GW 31					44.6	0.4	31.1					1.5	NC		29.32
GW 32					24.2	1.3	24.7					2.0	.50		25.75
GW 33					49.9	0.6	36.7					3.5	NC		28.62
GW 34					53.3	0.3	35.6					2.5	NC		20.35
LP1					4.9	19.1	1.4					1/8	0		14.04
LP2					48.7	4.0	25.5					.25	NC		22.61
LP3					49.3	2.3	23.4					1/8	NC		11.47
LP4					47.8	4.4	22.9					1.5	.75		18.79
LP8					47.5	4.7	27.6					3	1.5		27.35
LP10					38.0	0.6	23.7					.50	1/8		13.21
LP11					27.5	0.6	22.7					1.0	.50		16.96
MHE					18.1	11.6	12.4					1.0	1/8		27.49
MHW					0	20.2	0					0	NC		30.69

Note: (1) I = initial reading; P = post adjustments; NC = no change.

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Landfill Gas/Leachate Monitoring
H.O.D. Landfill
Antioch, Illinois

Person sampling: Jason Schoephoester Date: 12/17/03

Ambient temperature: 33 °F

Barometric pressure: 29.7 in. Hg

Trend in barometric pressure: Rising

Weather conditions: Cloudy, Breezy, Snow Showers

Ground conditions: moist to wet, trace snow

Gas/O_2 meter model: Landtec GA-90 Serial #: RMT 1049

Date last calibrated: 12/17/03

Notes: Blower/Flare data taken before gas-to-energy system started.
After gas-to-energy system started:
Flare temp: 1150°F
Flow to flare: 120 cfm
Flow to Turbines: 150 cfm

BLOWER/FLARE DATA

ITEM (UNITS)	INITIAL READINGS	POST ADJUSTMENTS
Flow rate (scfm)	265 cfm	Gas levels
Combustion temperature (°F)	1593°F	after gas-to-
Blower inlet pressure (in H_2O)	-47	energy system
Blower outlet pressure (in H_2O)	+50"	started.
Blower building valve setting	~40% open	
Gas inlet temperature (°F)	52	
% CH_4	47.2	46.8
% CO_2	30.1	
% O_2	1.2	1.9
% Balance gas		

LEACHATE LOADOUT FACILITY DATA

Leachate tank level	5.9	Feet
Pump operation (hours)		Hours
Leachate pumped (gallons)		Total gallons
Compressor pressure	114	PSI
Compressor temperature	175	°F

Notes:

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Maintenance Reports

MAINTENANCE REPORT
H.O.D. LANDFILL
ANTIOCH, ILLINOIS

Prepared By: Jason Schoephoester

Date Prepared: 11/16/03

Date(s) Maintenance Performed: 11/10 - 11/11/03

Name of Contractor(s): A-1 Air (for compressor work)

Type of Maintenance	Scheduled	Responsive	Nature of Work Performed/Location
☐ Groundwater well	☐	☐	
☐ Gas probe	☐	☐	
☒ Extraction wells/ condensate sumps		☒	General maintenance (see next page)
☐ Extraction system piping	☐	☐	
☒ Blower facility	☒	☐	see next page
☐ Flare	☐	☐	
☐ Vegetation	☐	☐	
☐ Erosion control		☐	
☐ Settlement		☐	
☐ Access road	☐	☐	
☐ Fencing/Signs	☐	☐	
☐ Leachate seep		☐	
☐ Other		☐	

DETAILED DESCRIPTION OF MAINTENANCE PERFORMED:

(Attach additional pages if necessary and contractor's invoice with description of services rendered, if applicable).

- Extended flex hoses on wells: GW-30, GW-31, and MHE
- Replaced wellhead valve on GW-21
- Changed out brass leachate check valve at GW-24 to Schedule 80 PVC
- GWF-10 sealed wellhead with silicone
- GW-31 replaced wellhead with wellhead that extends fully into well casing.
- Drained water from all regulator condensate bowls
- A-1 Air onsite for air compressor + air dryer maintenance
  - ↳ changed oil, cleaned/replaced filters, checked dessicant, changed mufflers, adjusted dryer valves
- Pulled, cleaned, adjusted following pumps: GWF-2, GWF-3, GWF-10, GW-21, GW-22, and GW-24
- Drained surface water from several vault boxes

Cost: $ ____________

Professional Engineer or Firm Preparing Documentation: ____________
(if applicable, i.e., settlement repair, leachate seep repair)

MAINTENANCE REPORT
H.O.D. LANDFILL
ANTIOCH, ILLINOIS

Prepared By: Jason Schoephoester

Date Prepared: 11/18/03

Date(s) Maintenance Performed: 11/17/03

Name of Contractor(s): N/A

Type of Maintenance	Scheduled	Responsive	Nature of Work Performed/Location
☐ Groundwater well	☐	☐	
☐ Gas probe	☐	☐	
☒ Extraction wells/ condensate sumps		☐	see next page
☐ Extraction system piping	☐	☐	
☒ Blower facility	☒	☐	Greased Blower
☐ Flare	☐	☐	
☐ Vegetation	☐	☐	
☐ Erosion control		☐	
☐ Settlement		☐	
☐ Access road	☐	☐	
☐ Fencing/Signs	☐	☐	
☐ Leachate seep		☐	
☐ Other		☐	

DETAILED DESCRIPTION OF MAINTENANCE PERFORMED:

(Attach additional pages if necessary and contractor's invoice with description of services rendered, if applicable).

- Took leachate level readings + turned pumps back on.
- Adjusted vacuum at individual wells, based on gas level readings. (Fine tuning after 11/10 + 11/11/03 well balancing.)
- Pulled, cleaned, checked pump @ GW-29 - still not functioning correctly, will contact QED.

- Gas levels to flare:

On Arrival - CH_4: 42.3 CO_2: 30.4 O_2: 1.8 Flow = 295 cfm

At Departure - CH_4: 49.6 CO_2: 30.8 O_2: 1.3 Flow = 298 cfm

- Leachate tank level:

Before turning pumps on: @ 8[45] - 2.2' (~4300 gal)

After most pumps on: @ 14[30] - 4.3' (~10,800 gal)

- Vaison onsite - ran 10 turbines for ~ 1 hour.

Cost: $

Professional Engineer or Firm Preparing Documentation:

(if applicable, i.e., settlement repair, leachate seep repair)

MAINTENANCE REPORT
H.O.D. LANDFILL
ANTIOCH, ILLINOIS

Prepared By: Jason Schoephoester

Date Prepared: 12/16/03

Date(s) Maintenance Performed: 12/16/03

Name of Contractor(s): N/A

Type of Maintenance	Scheduled	Responsive	Nature of Work Performed/Location
☐ Groundwater well	☐	☐	
☐ Gas probe	☐	☐	
☒ Extraction wells/ condensate sumps		☒	Drained surface water from EW vaults.
☐ Extraction system piping	☐	☐	
☒ Blower facility	☒	☐	Recalibrated LEL monitors in compressor + dryer rooms.
~~☐ Flare~~	~~☐~~	~~☐~~	
☐ Vegetation	☐	☐	
☐ Erosion control		☐	
☐ Settlement		☐	
☐ Access road	☐	☐	
☐ Fencing/Signs	☐	☐	
☐ Leachate seep		☐	
☐ Other		☐	

DETAILED DESCRIPTION OF MAINTENANCE PERFORMED:

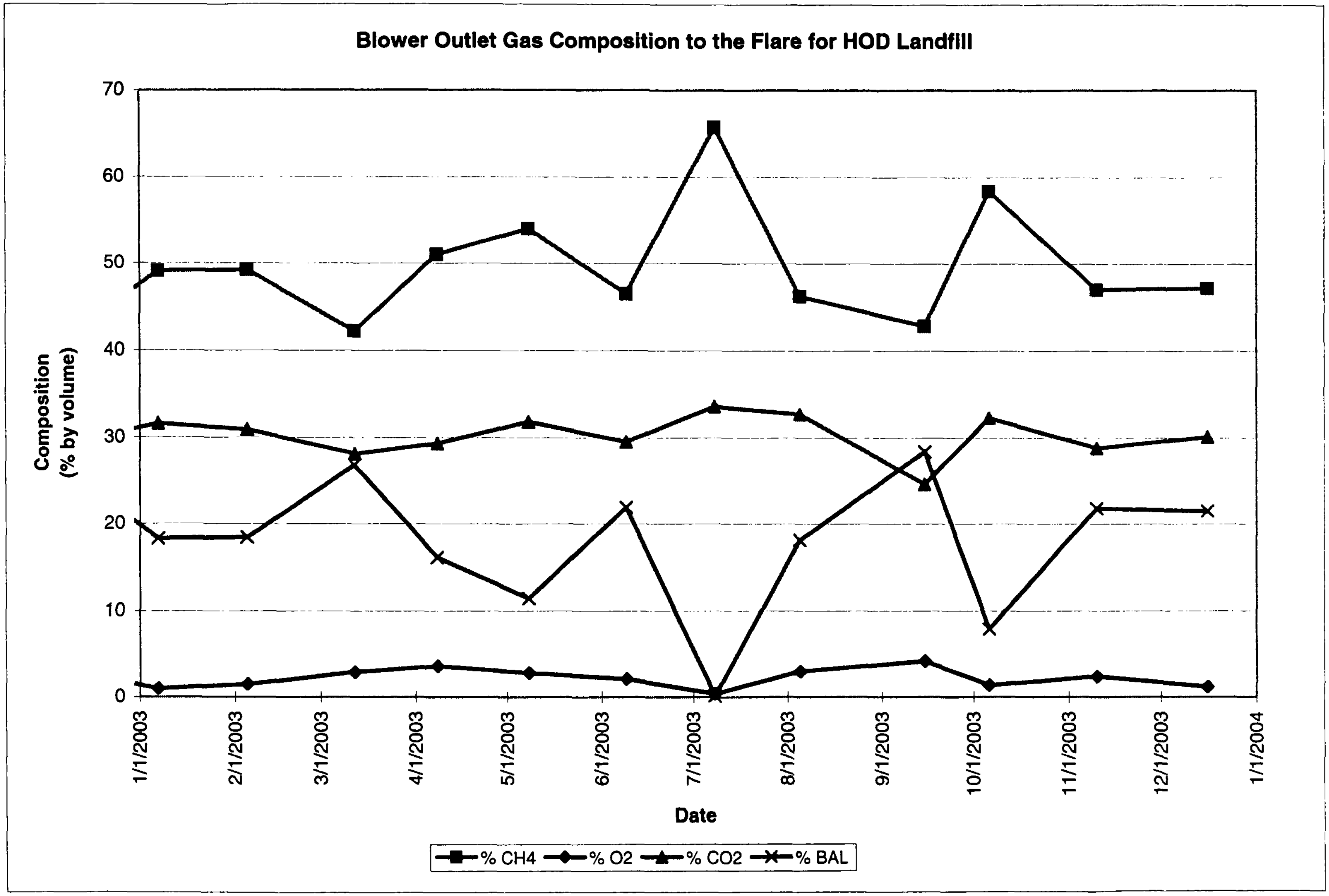
(Attach additional pages if necessary and contractor's invoice with description of services rendered, if applicable).

Cost: $

Professional Engineer or Firm Preparing Documentation:
(if applicable, i.e., settlement repair, leachate seep repair)

Appendix B
Landfill Gas Monitoring Data

Flare



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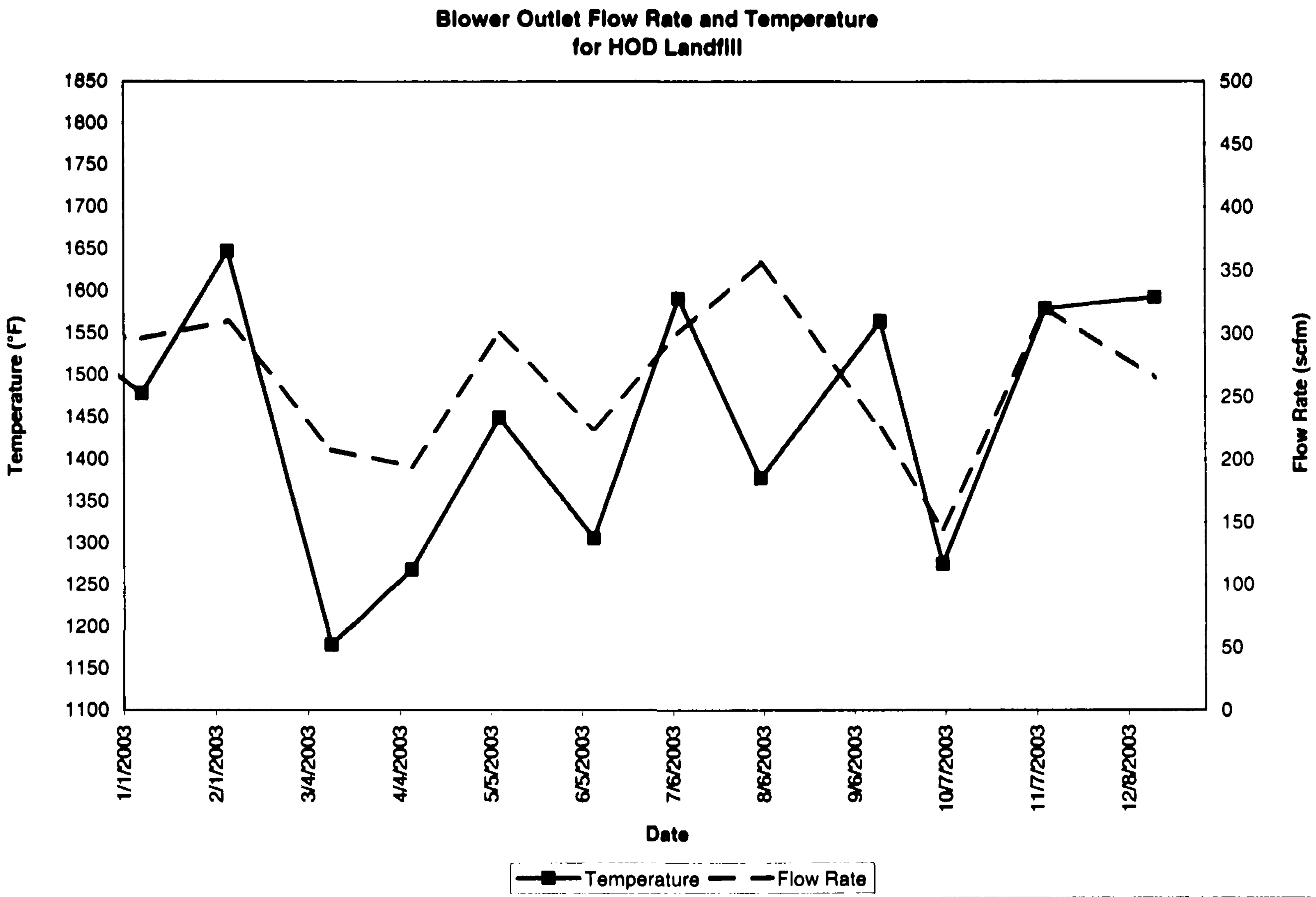

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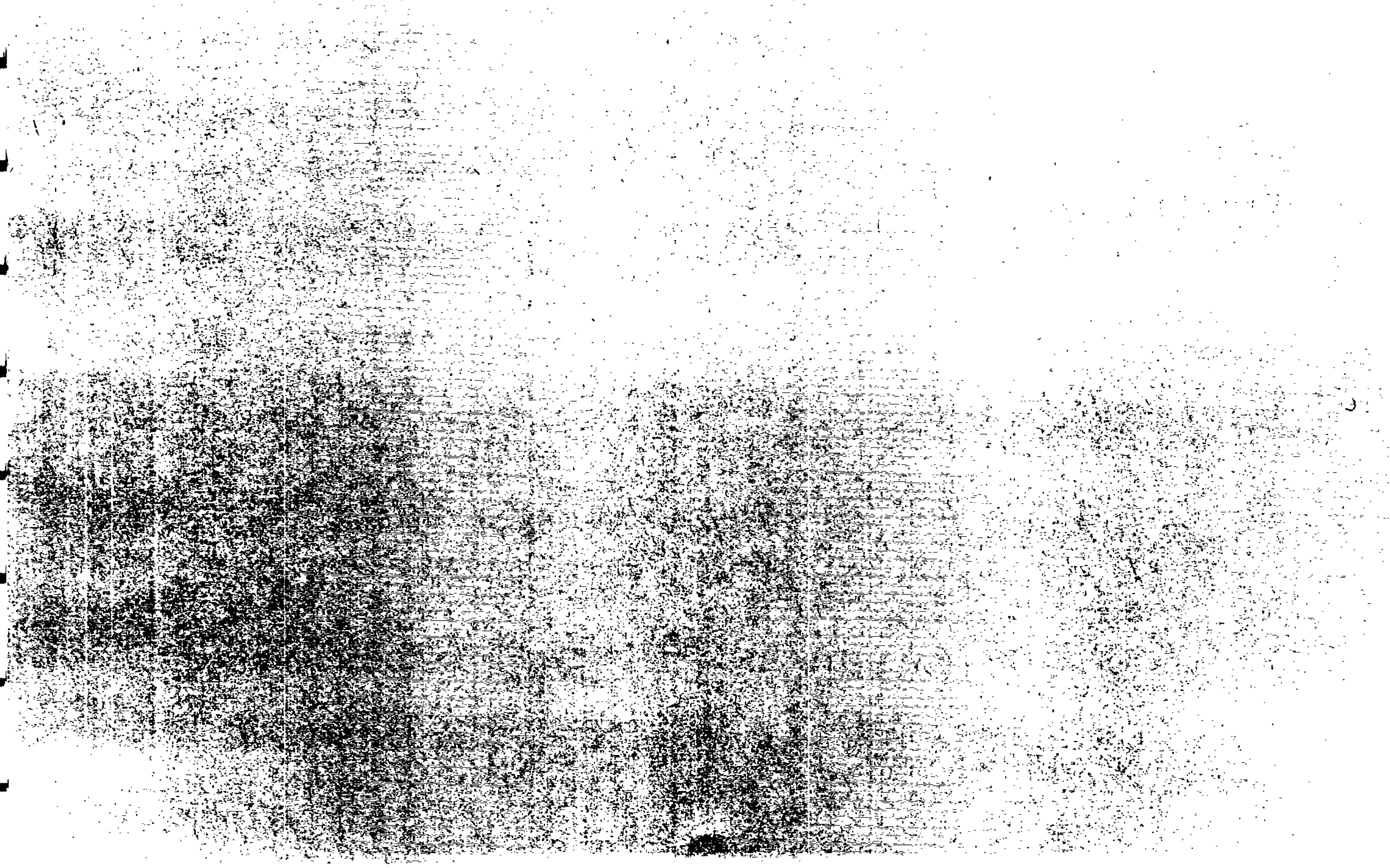
Gas Extraction Wells



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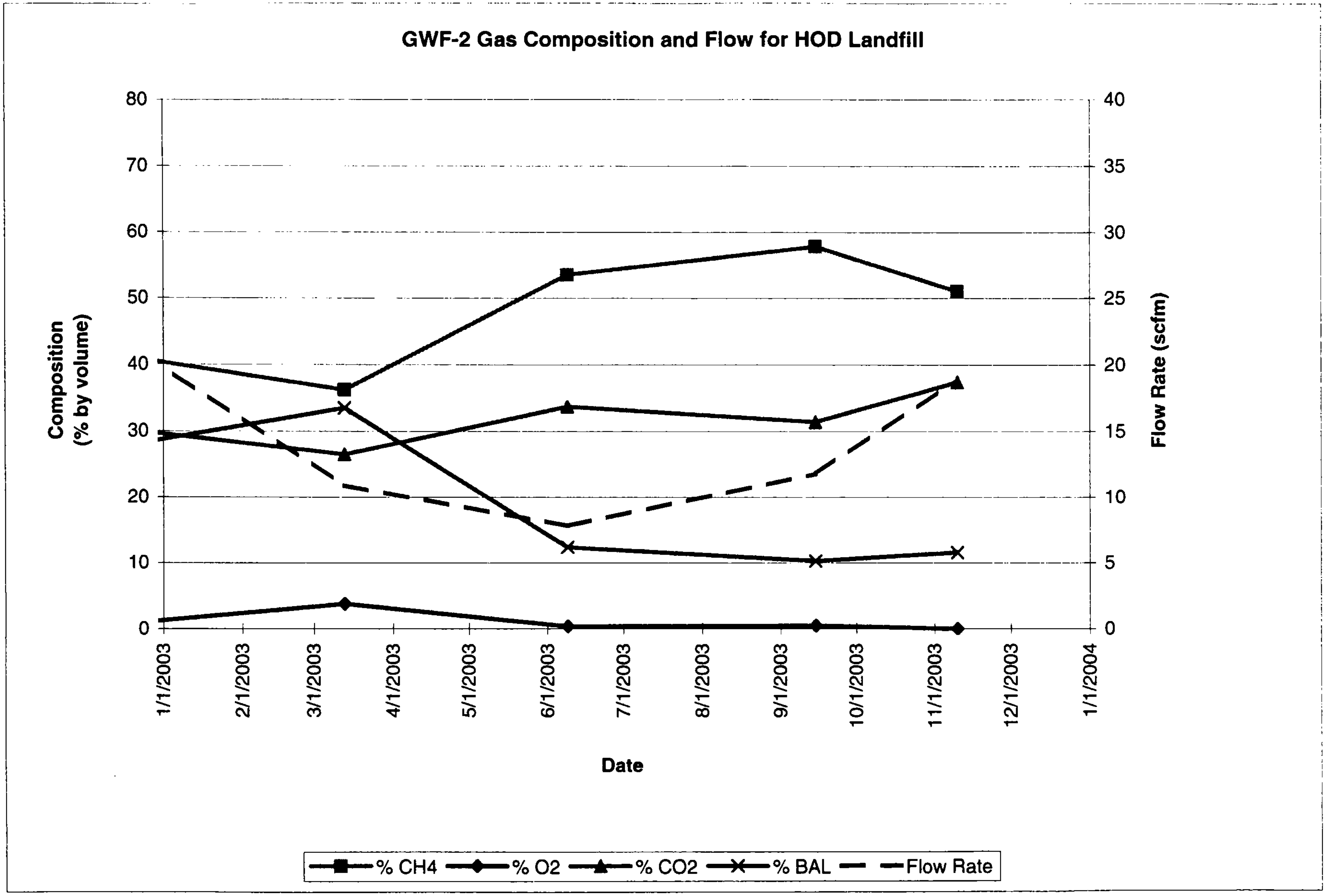

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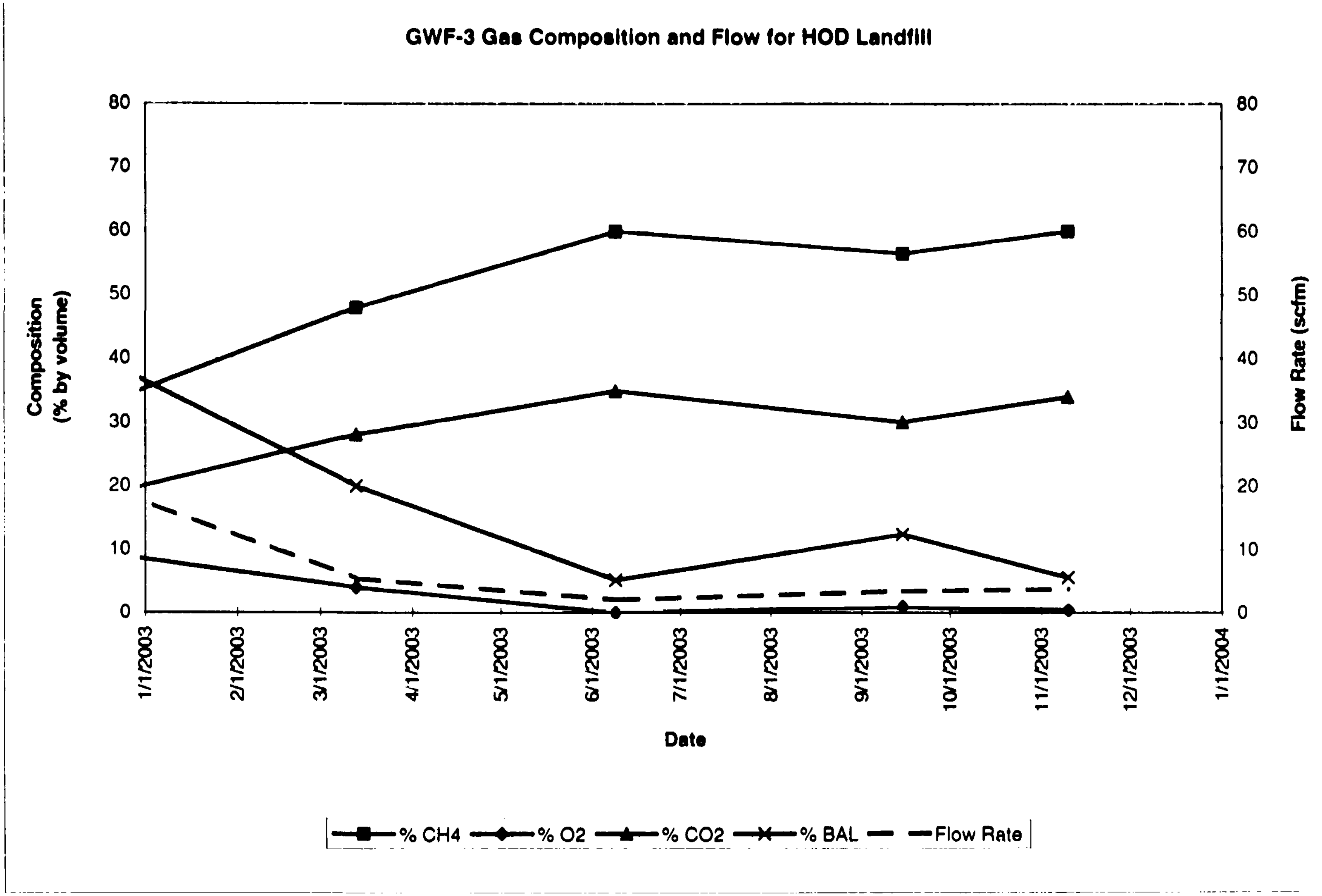

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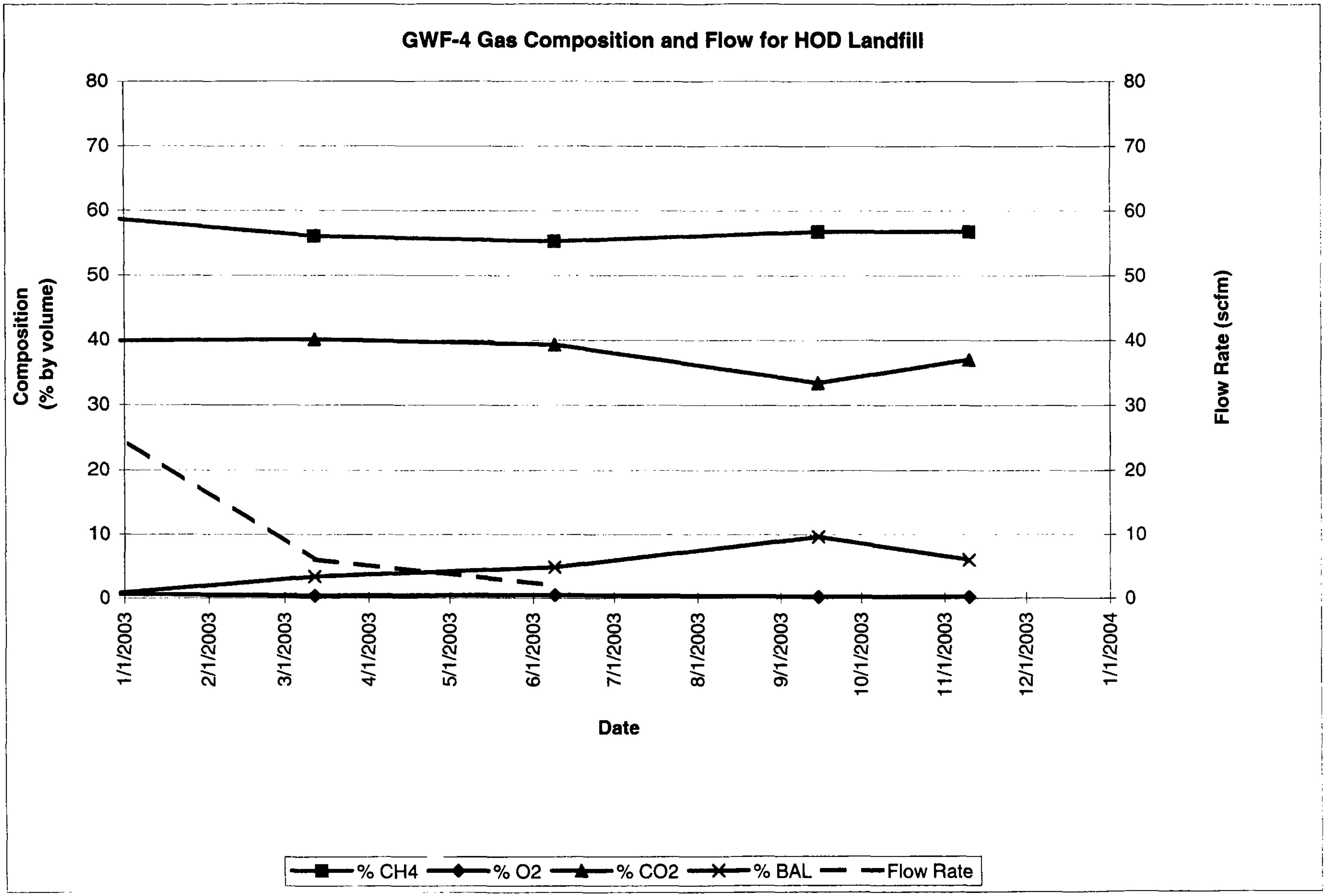

Note: Flow rate was not recorded during the September and November recording event due to a bad sampling port by the orifice plate.

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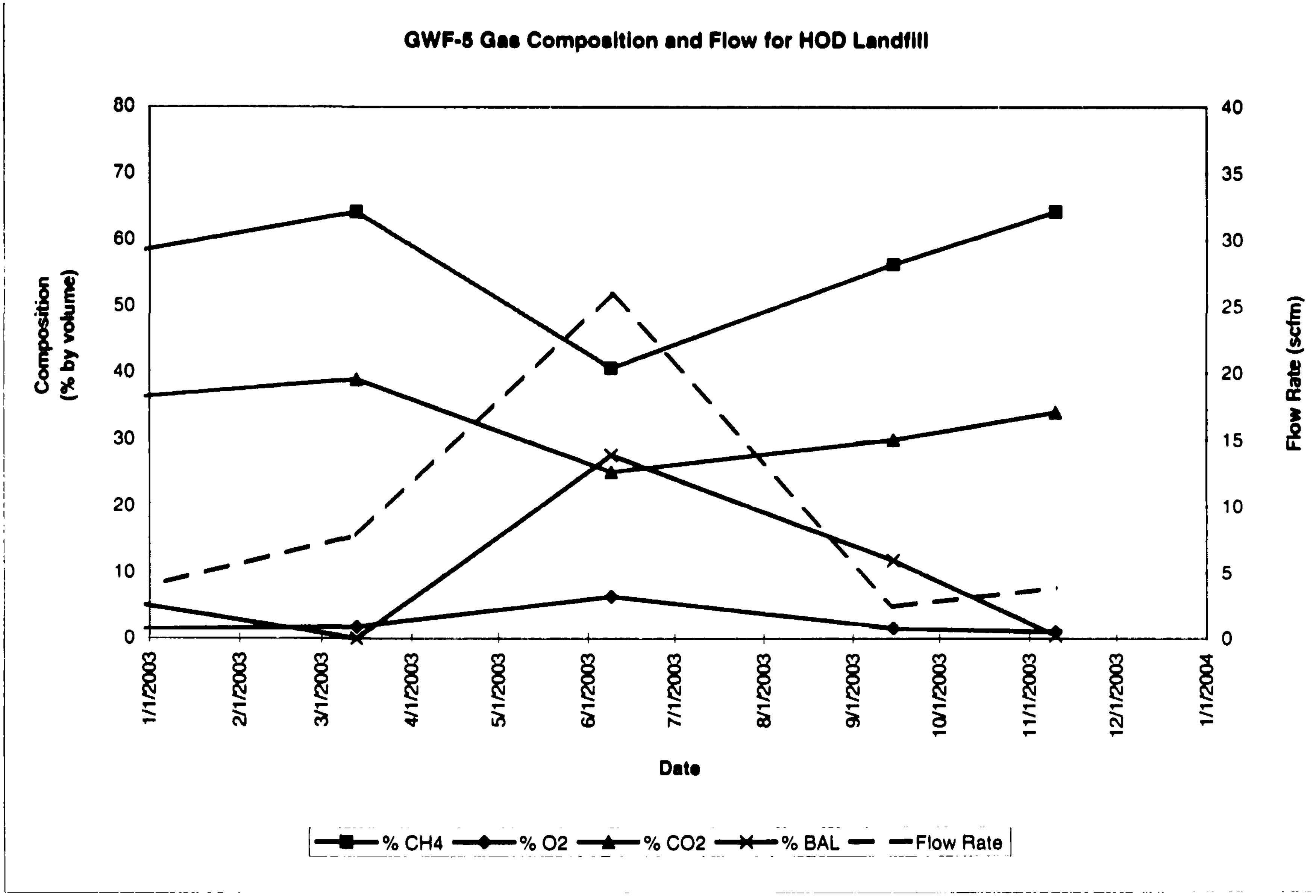

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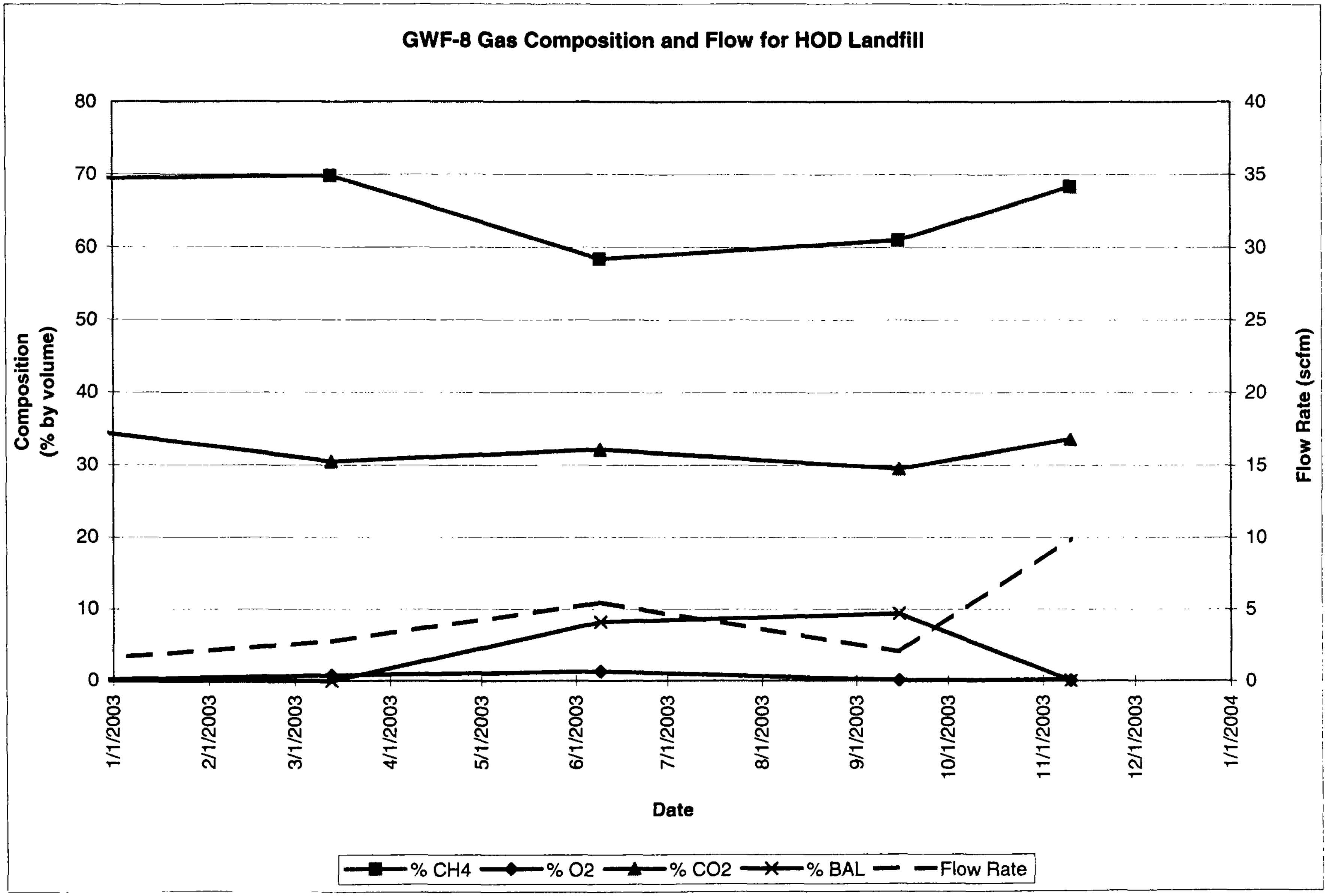

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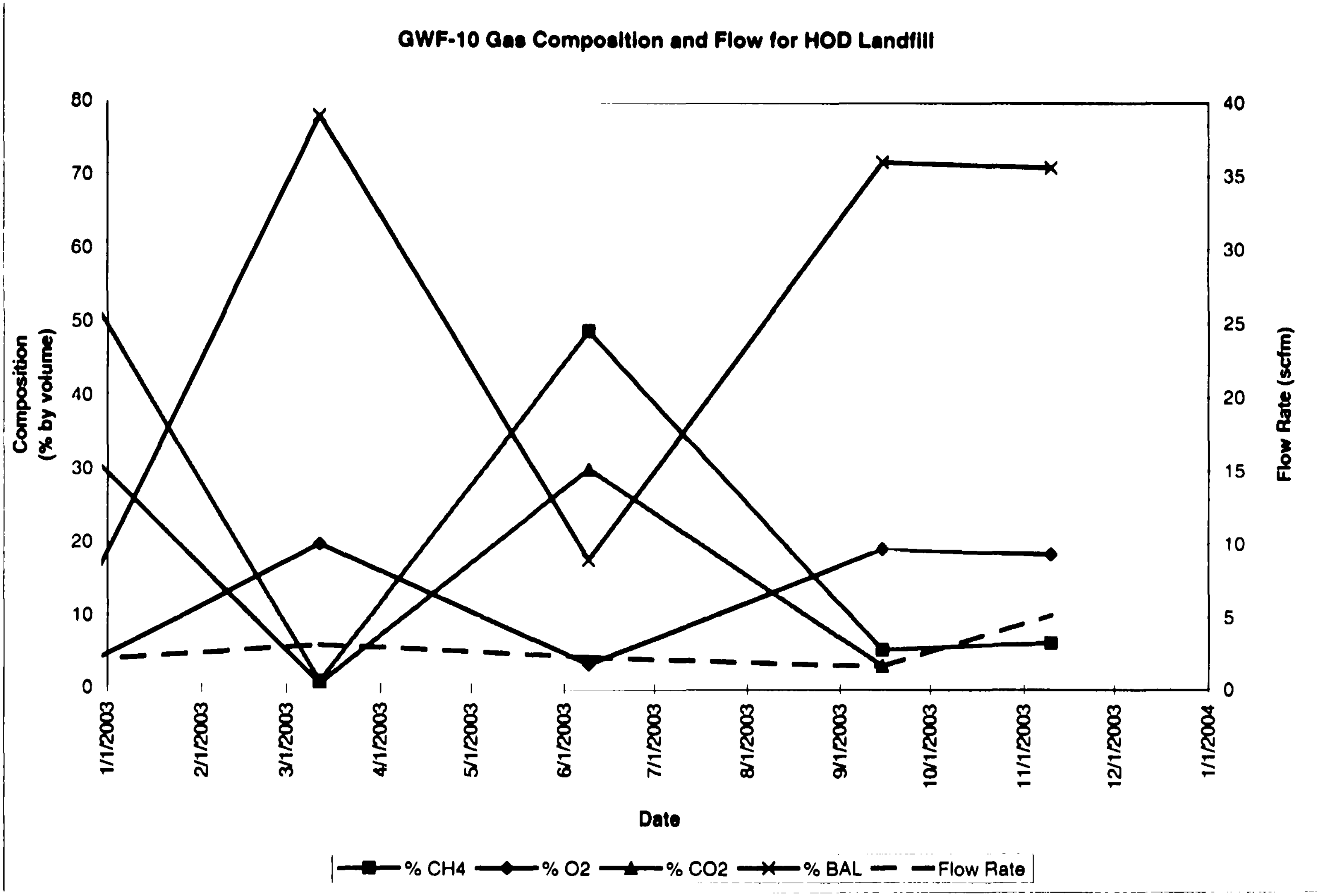

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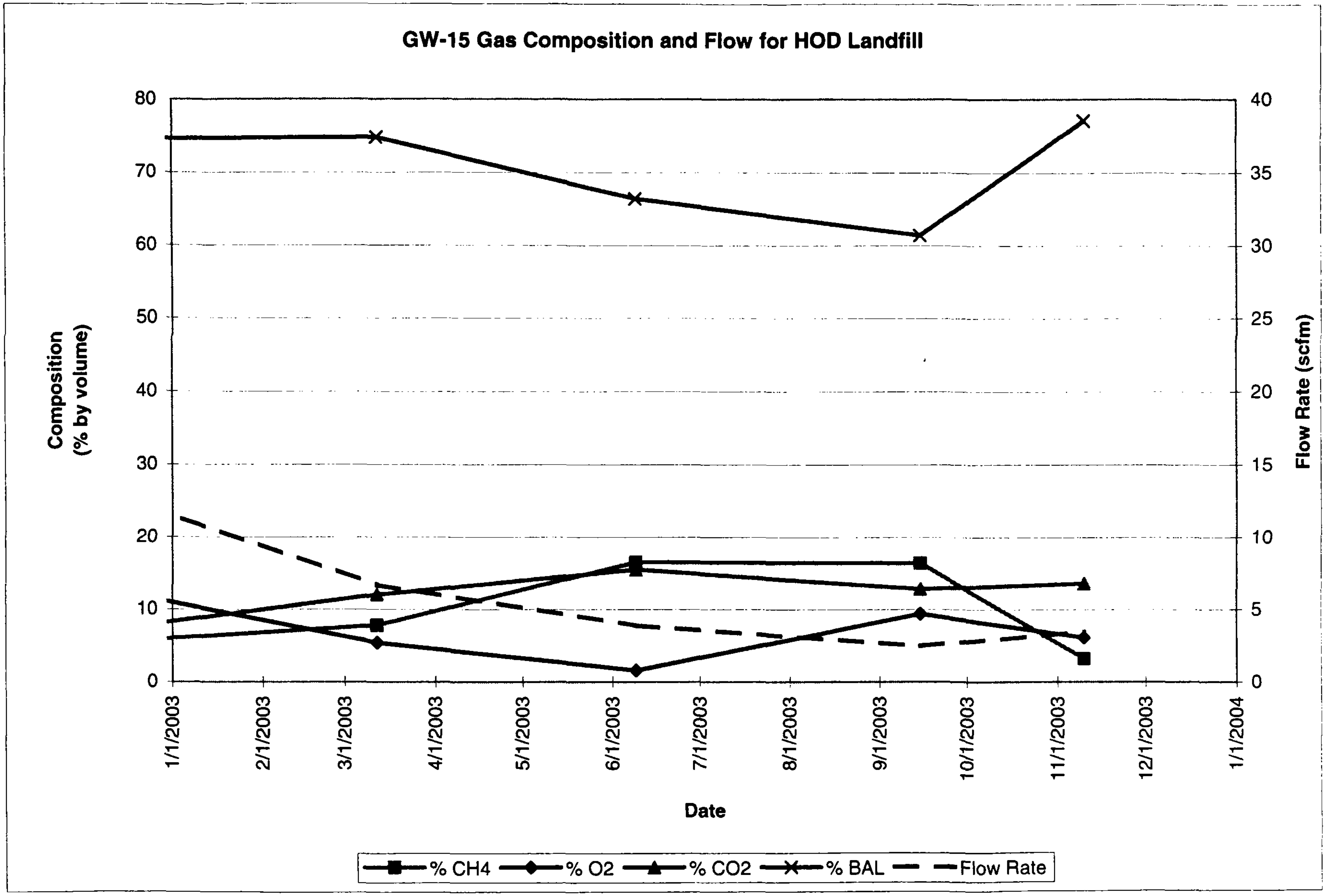

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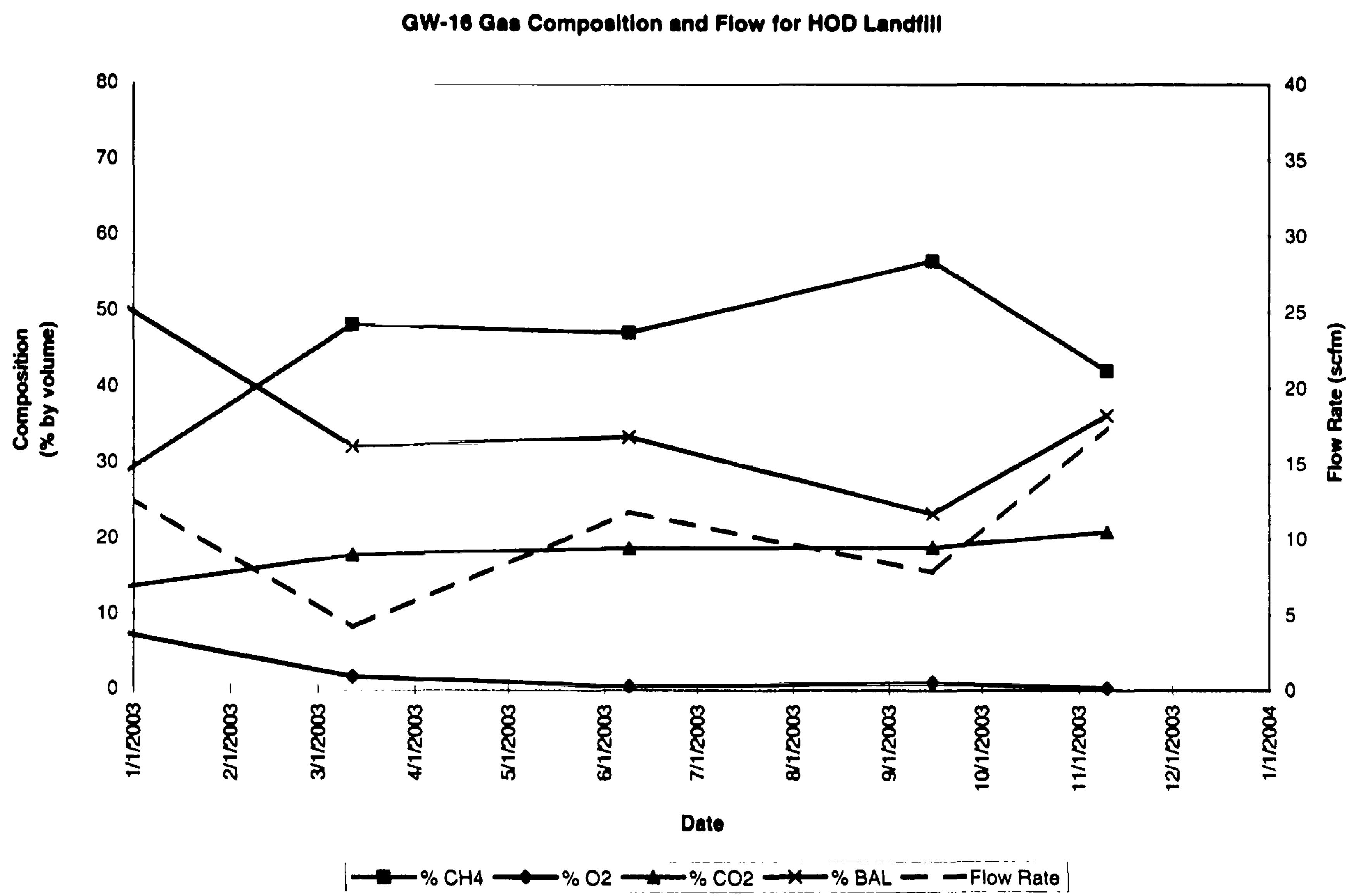

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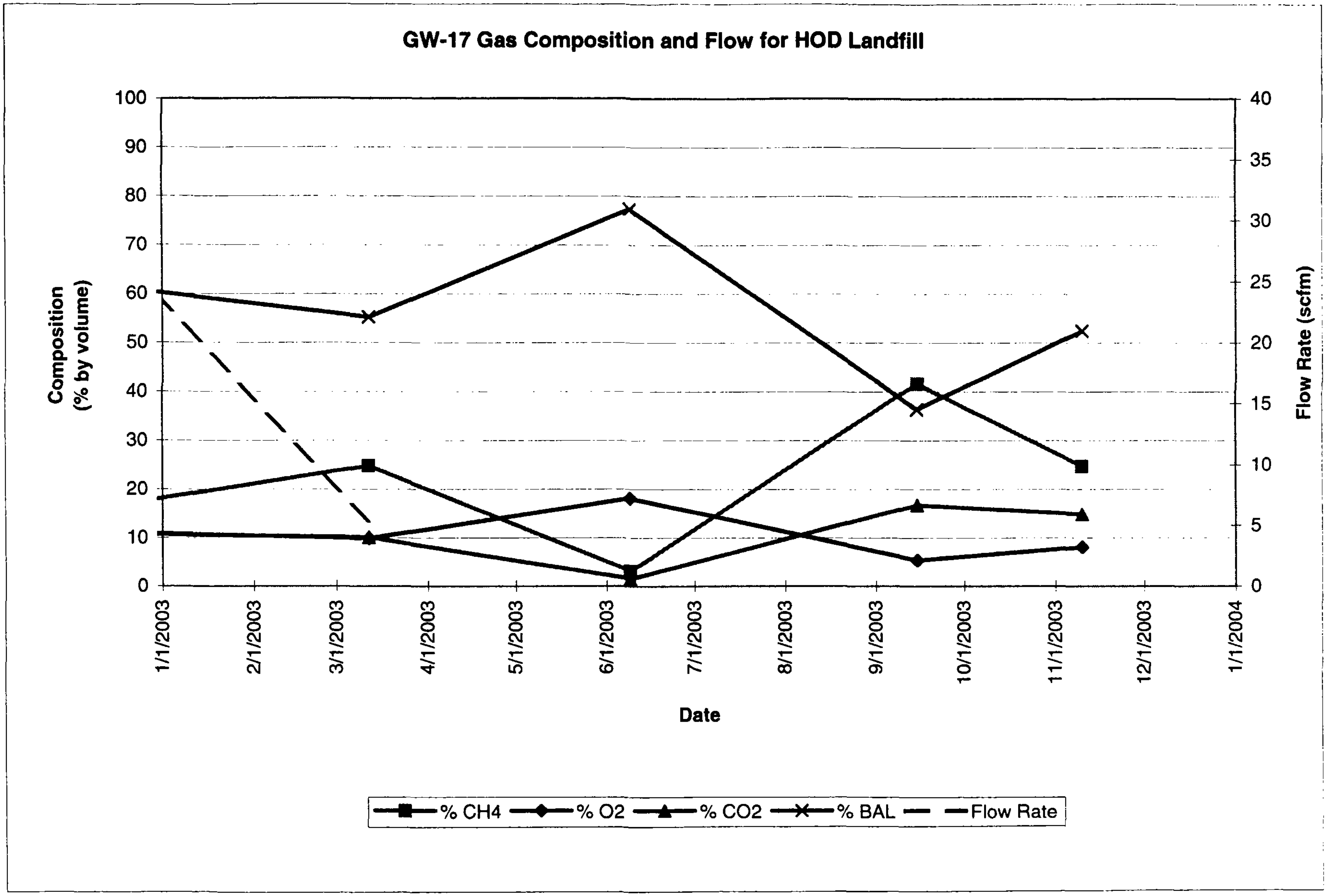

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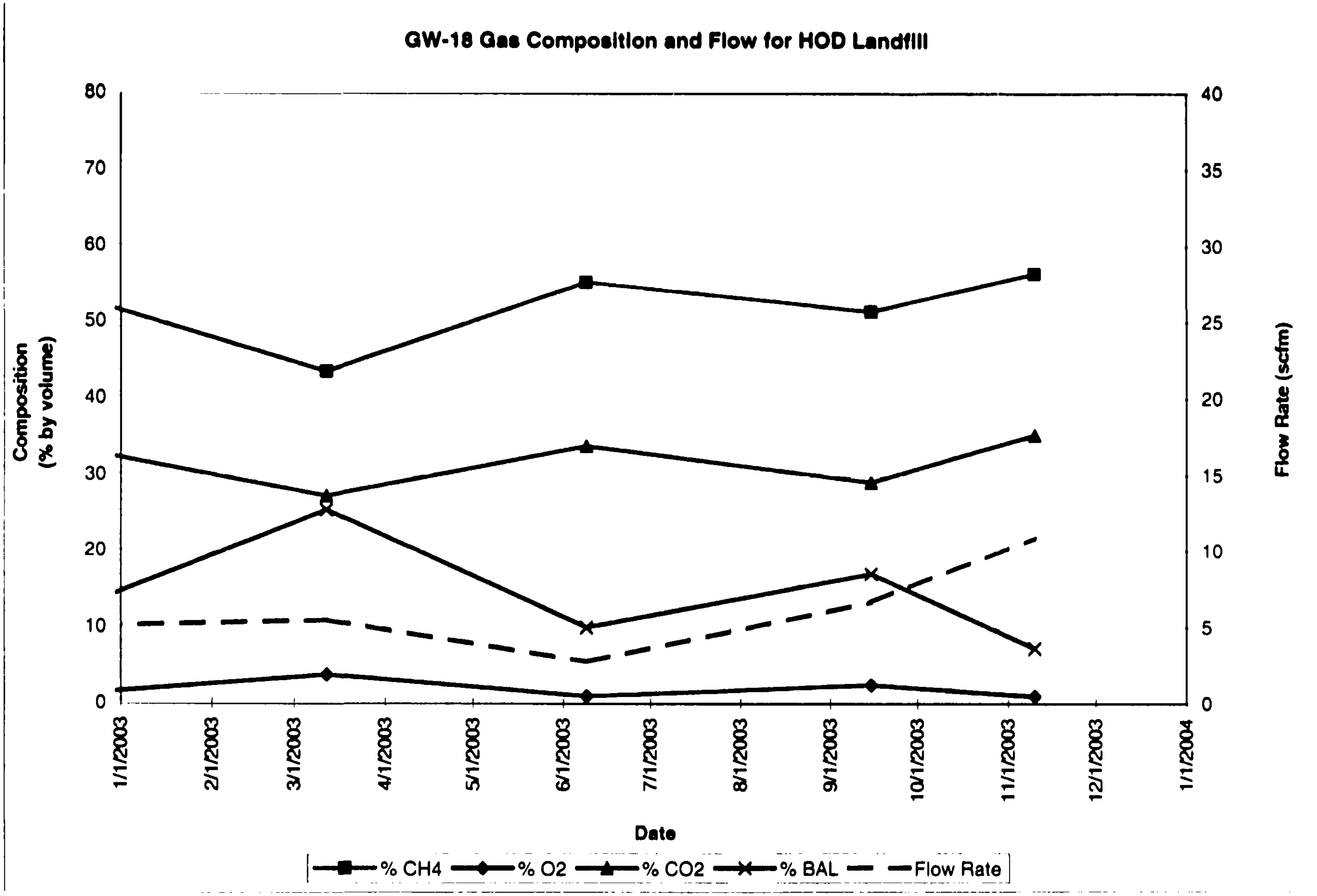
Note: Flow rate was not recorded during the June, September, and November monitoring events due a broken sampling port by the orifice plate. I:\WPMSN\PJT\00-05314\41\000531441-020.XLS 3/10/2004



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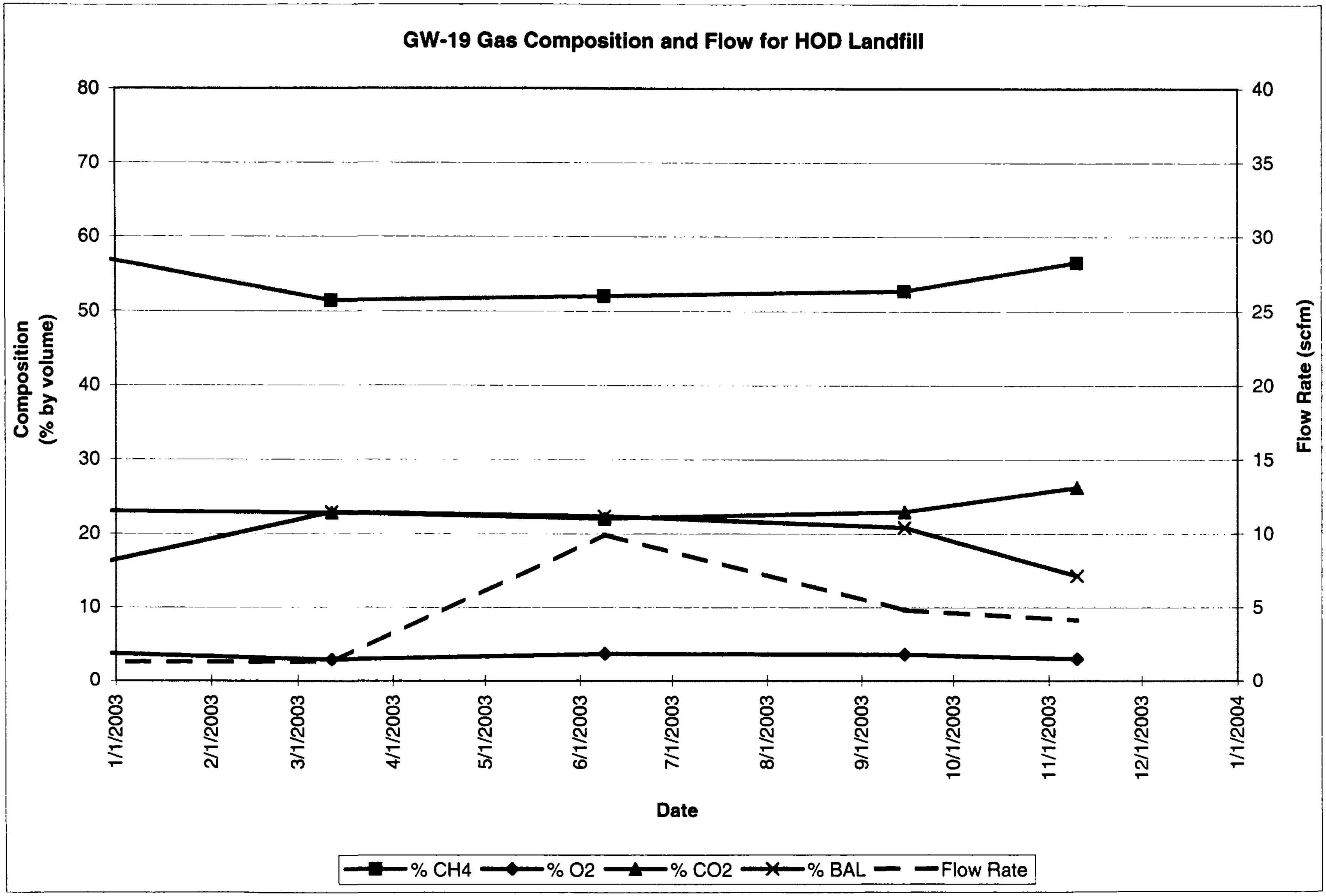
GW-19 Gas Composition and Flow for HOD Landfill
Composition (% by volume)
Flow Rate (scfm)
80
70
60
50
40
30
20
10
0
40
35
30
25
20
15
10
5
0
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
Date
% CH4
% O2
% CO2
% BAL
Flow Rate

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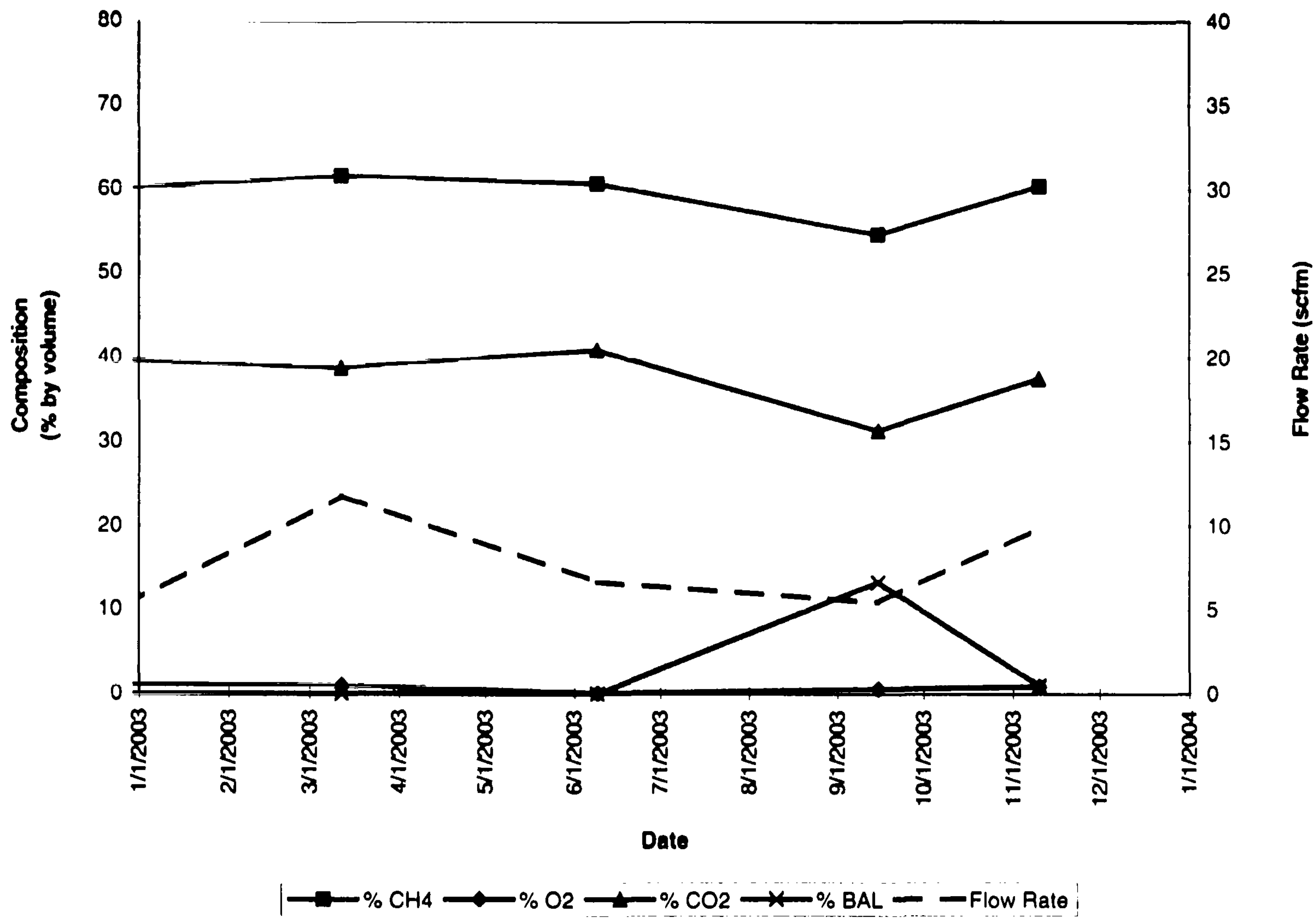
GW-20 Gas Composition and Flow for HOD Landfill



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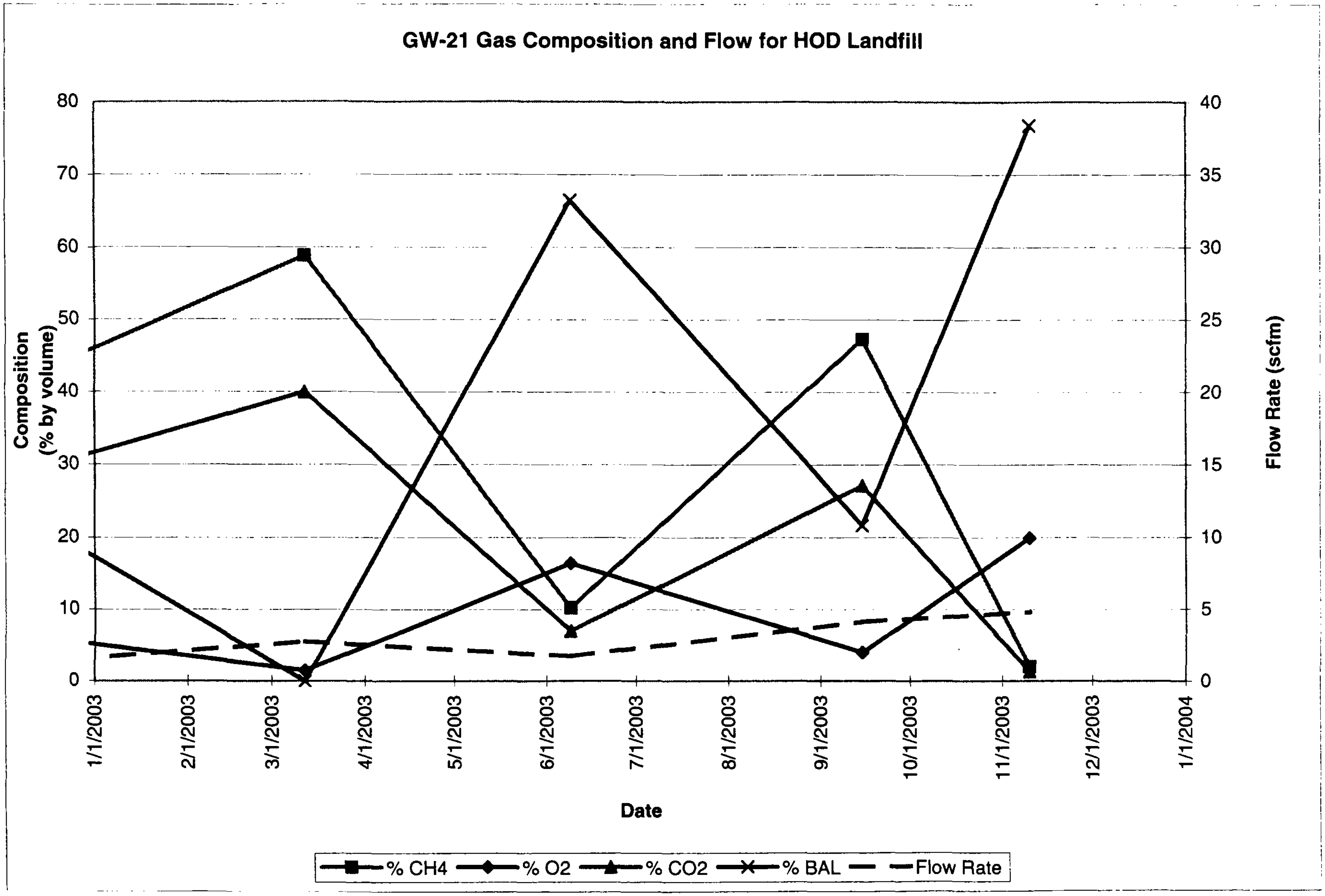

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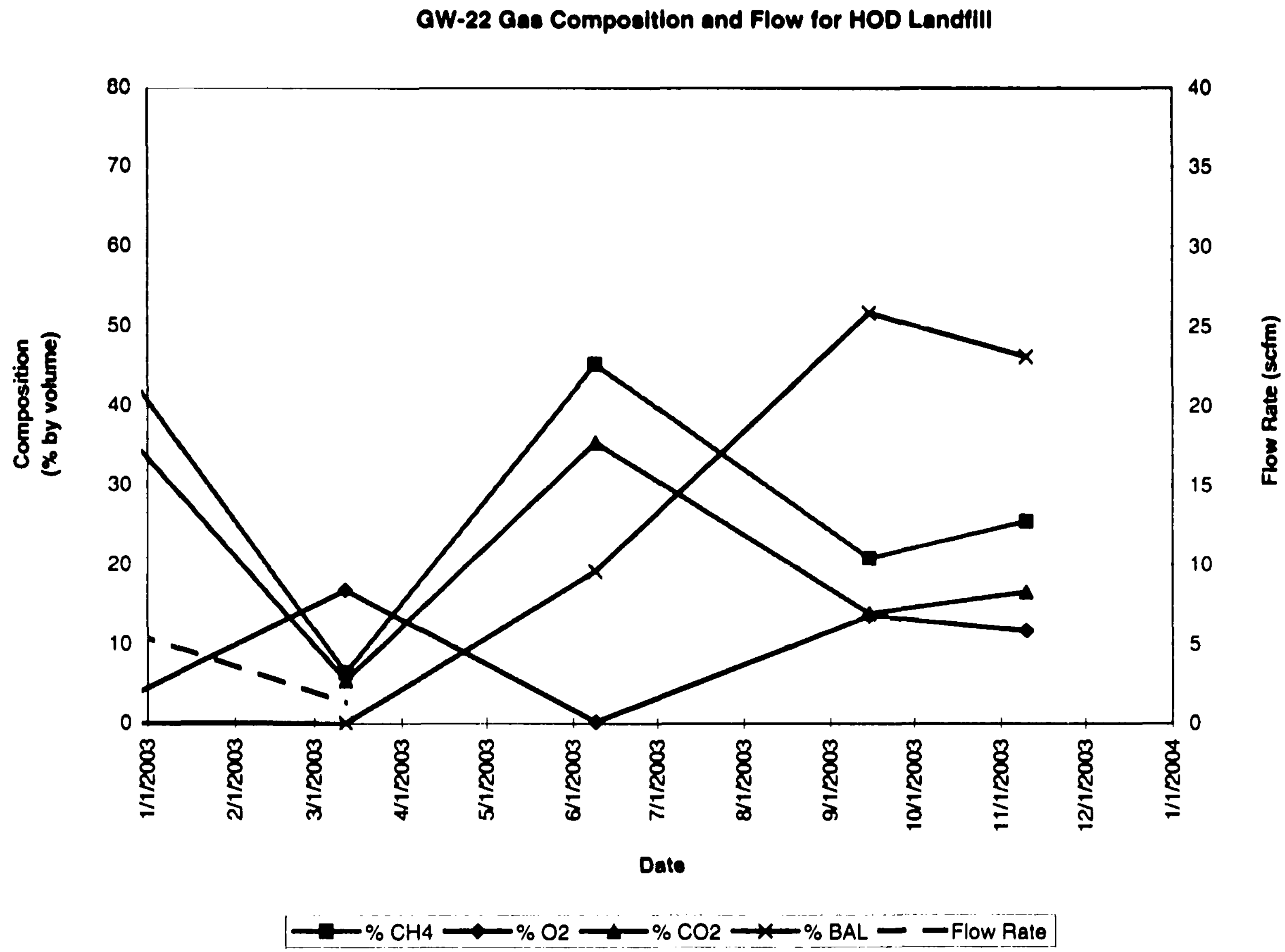

No flow rate recorded during the June, September, and November monitoring periods due to broken sampling ports by the orifice plate.

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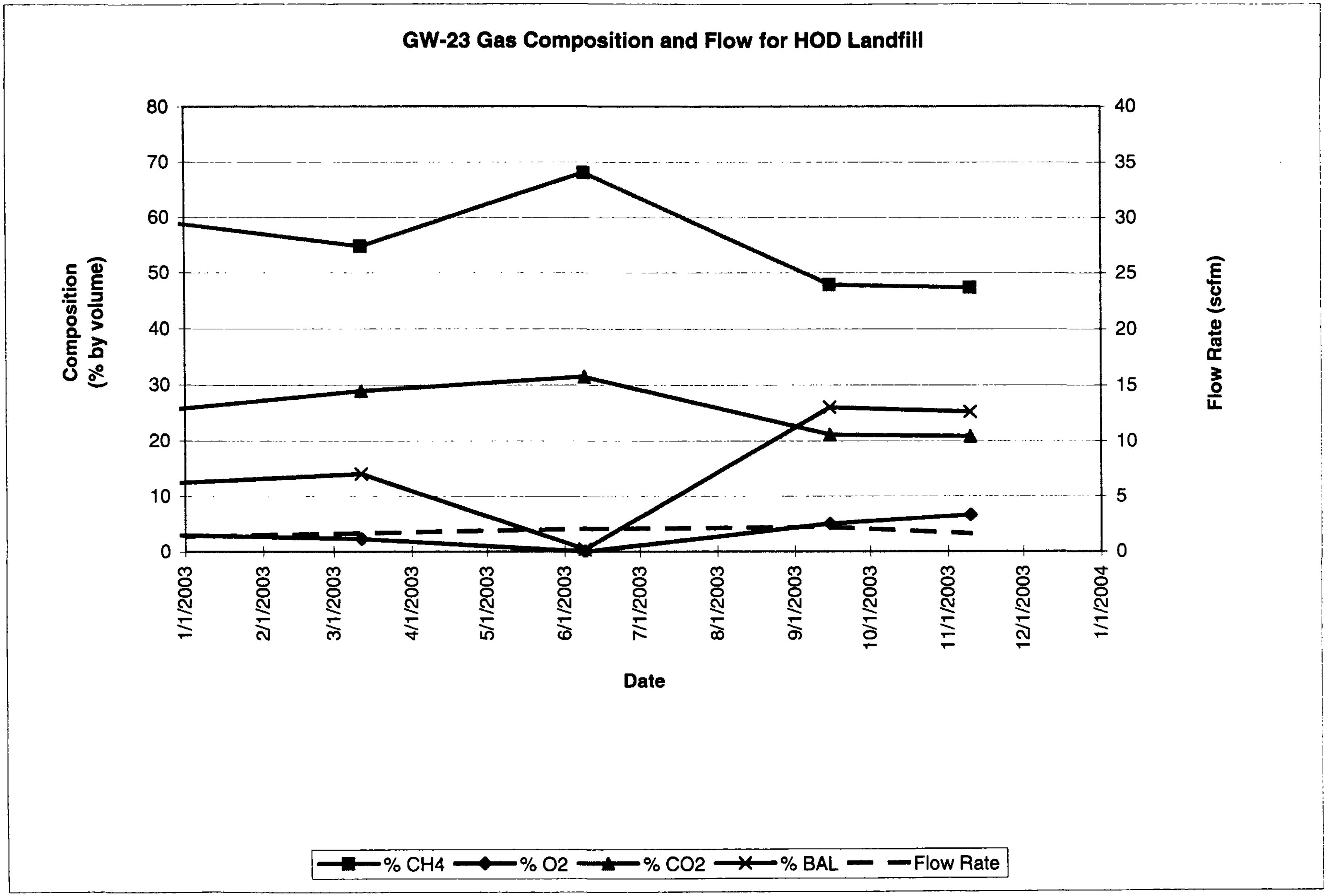

21

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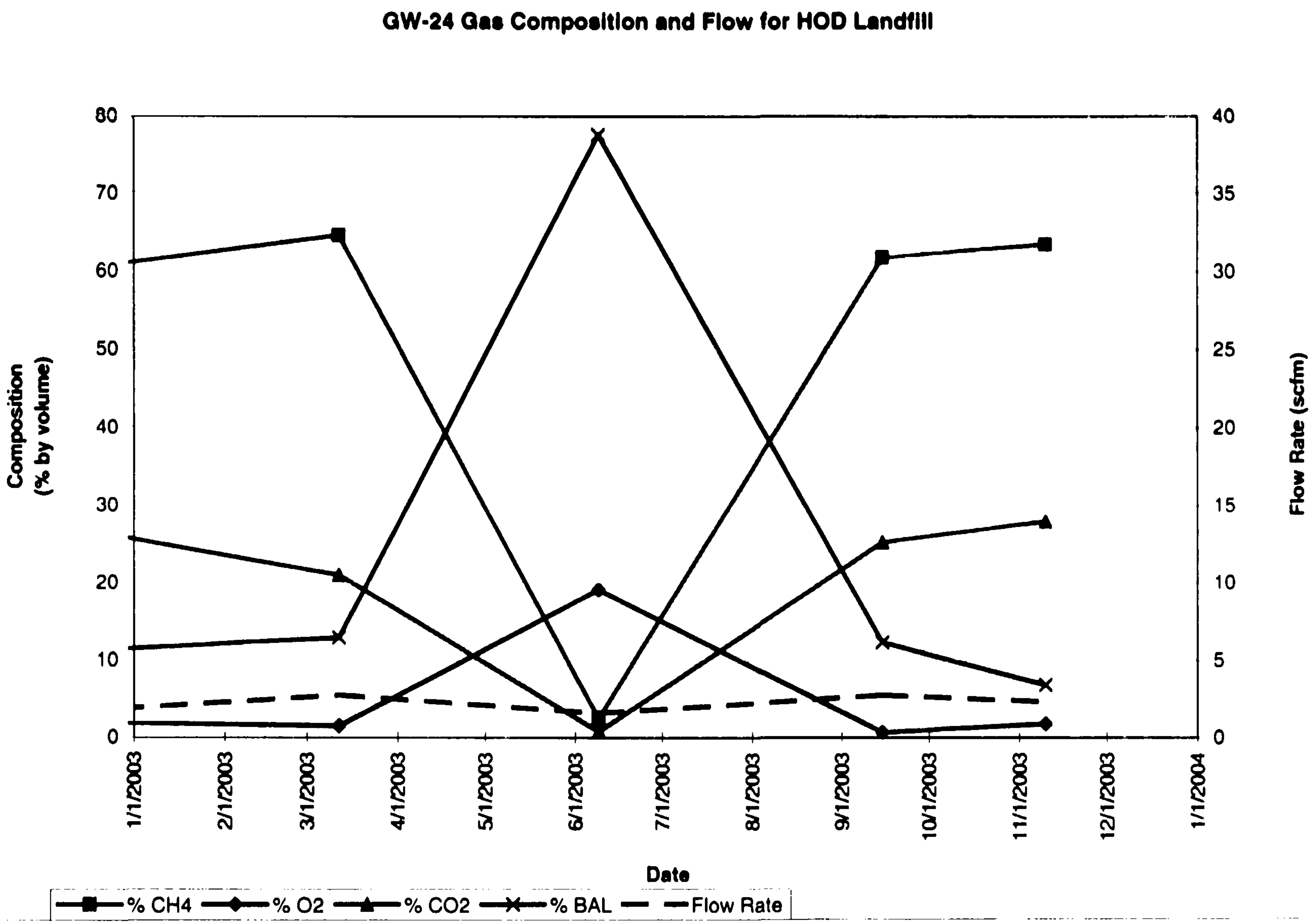
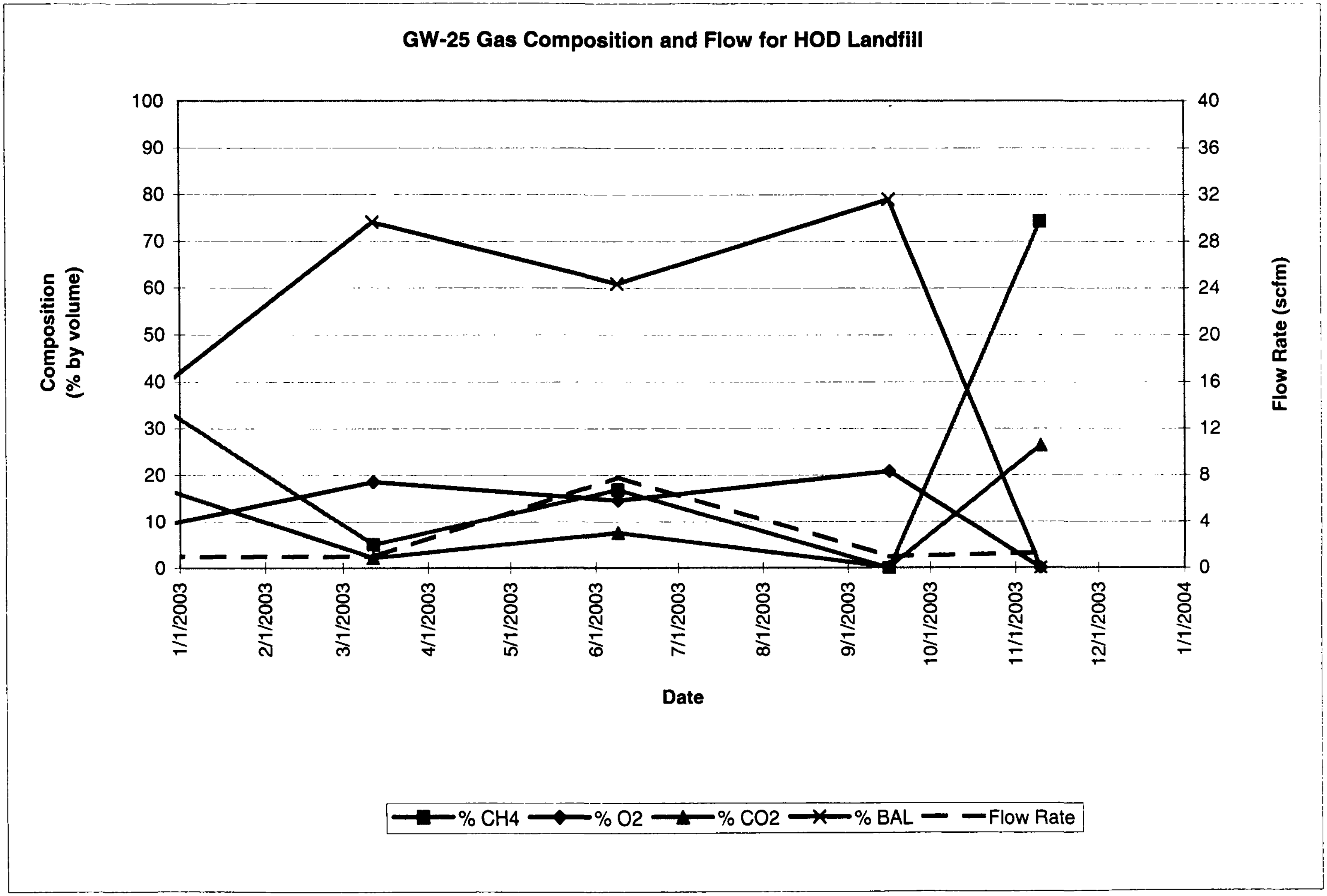


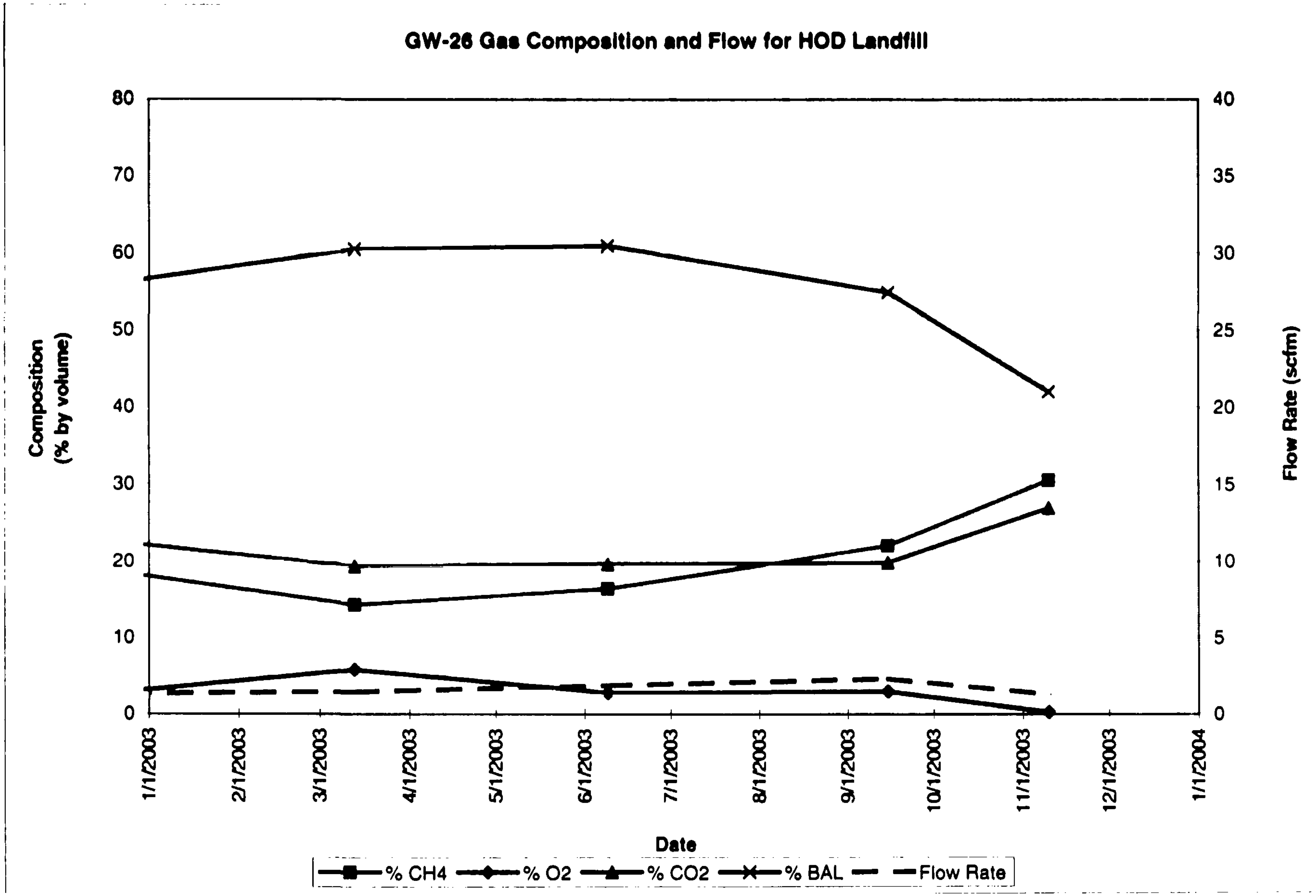
22

I:\WPMSN\PJT\00-05314\41\000531441-020 XLS 3/10/2004



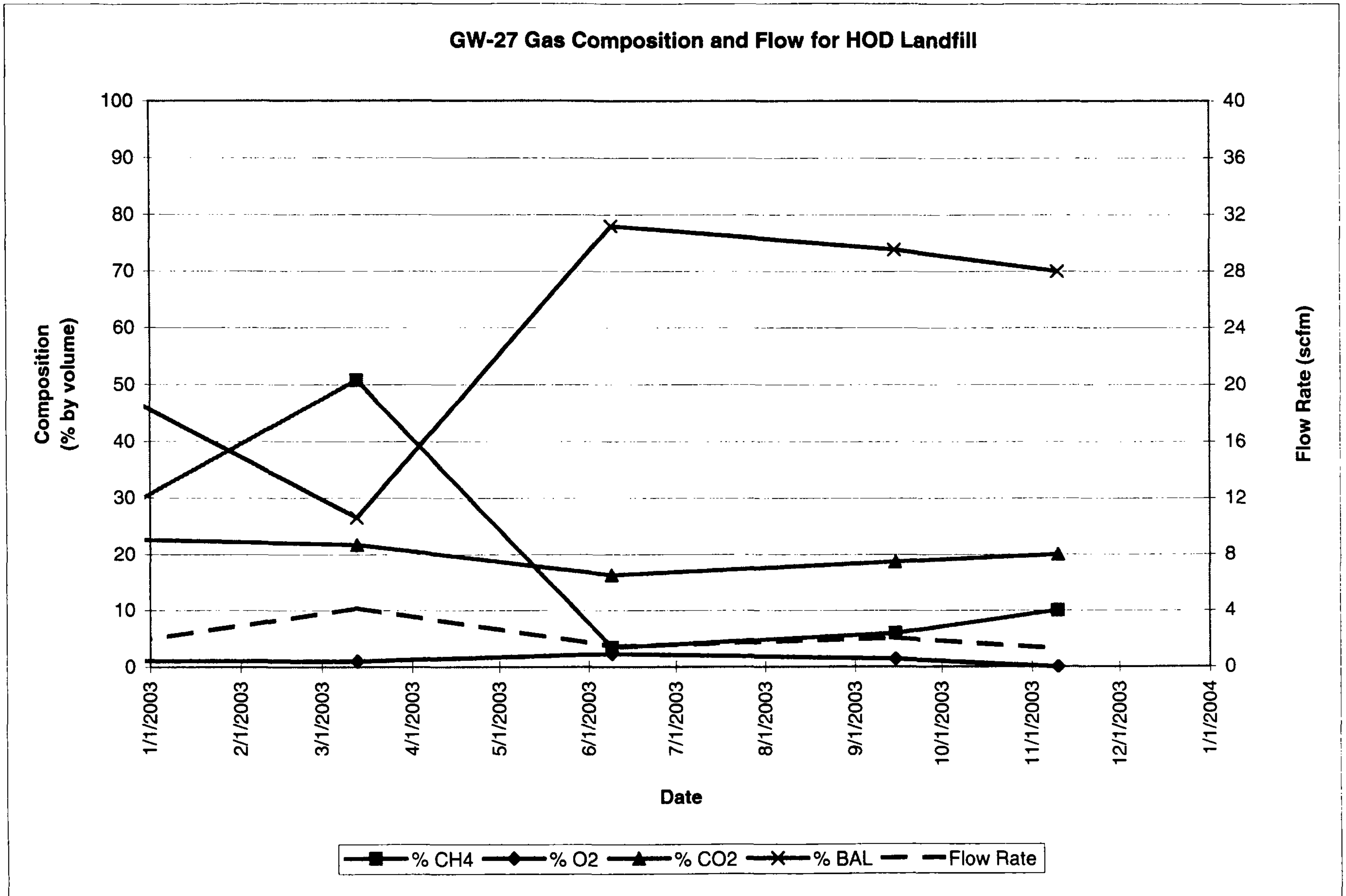
23

I:\WPMSN\PJT\00-05314\41\000531441-020.XLS 3/10/2004



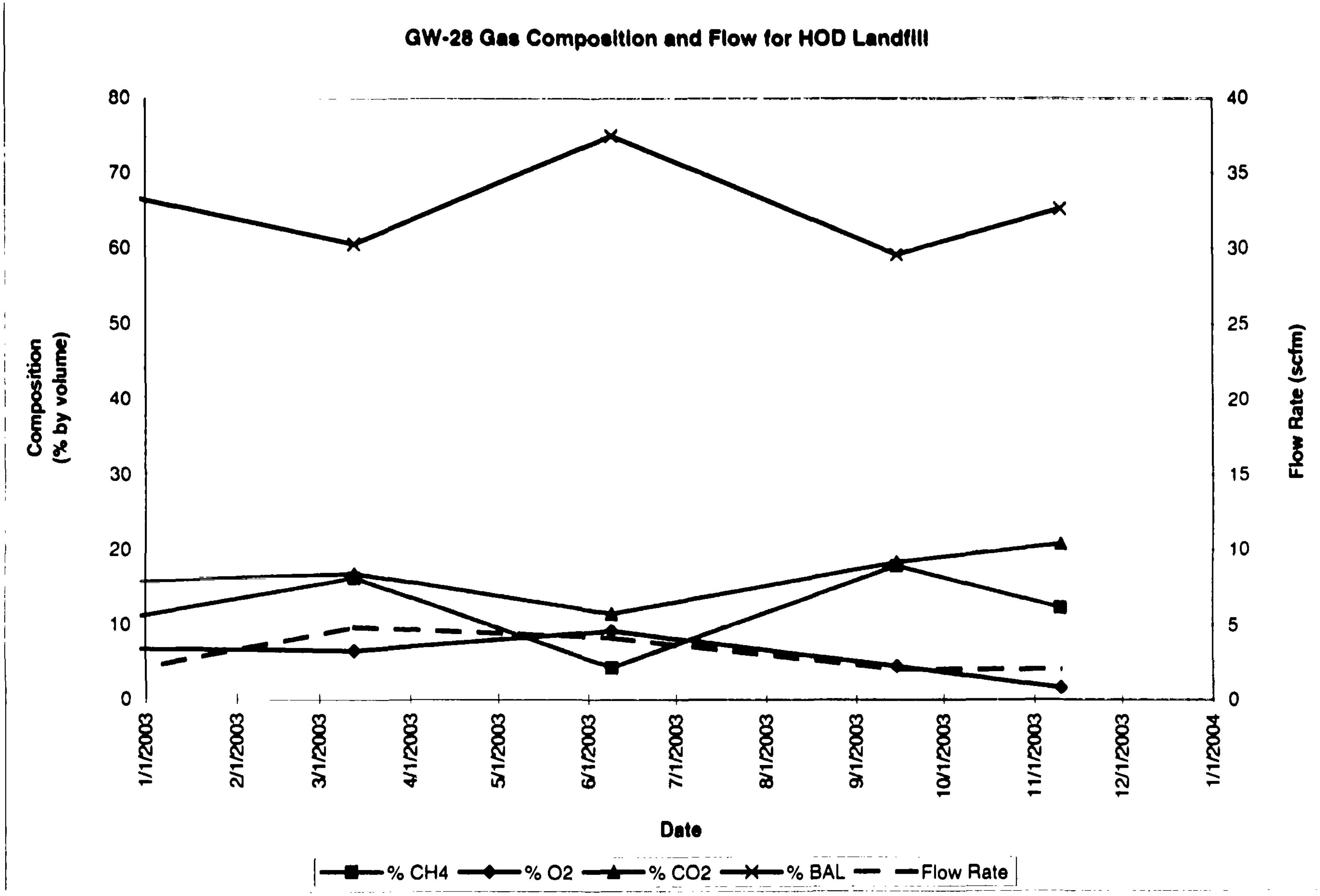
14

I:\WPMSN\PJT\00-05314\41\000531441-022 XLS 3/10/2004

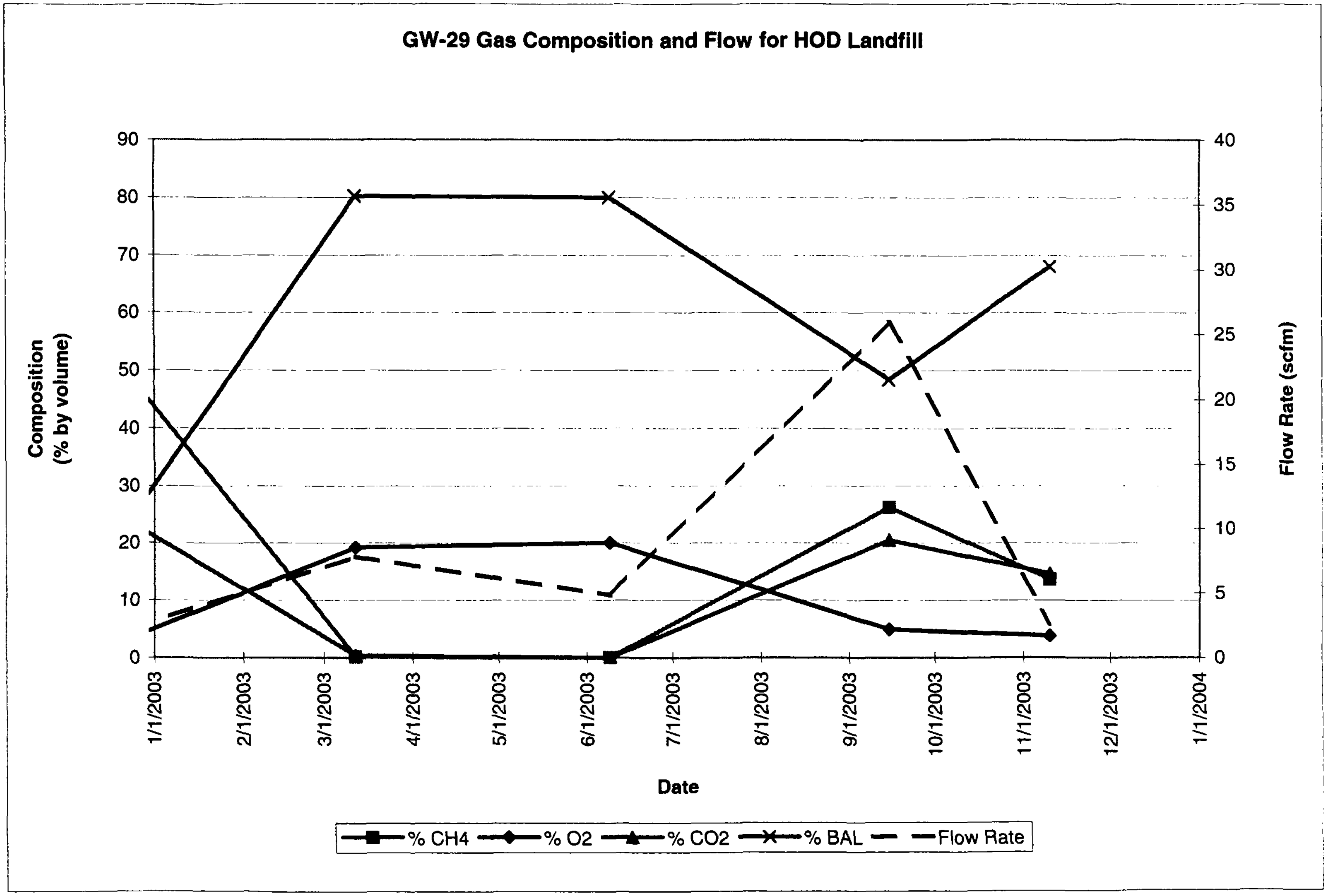


GW-27 Gas Composition and Flow for HOD Landfill
Composition (% by volume)
Flow Rate (scfm)
100
90
80
70
60
50
40
30
20
10
0
40
36
32
28
24
20
16
12
8
4
0
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
Date
% CH4
% O2
% CO2
% BAL
Flow Rate

25

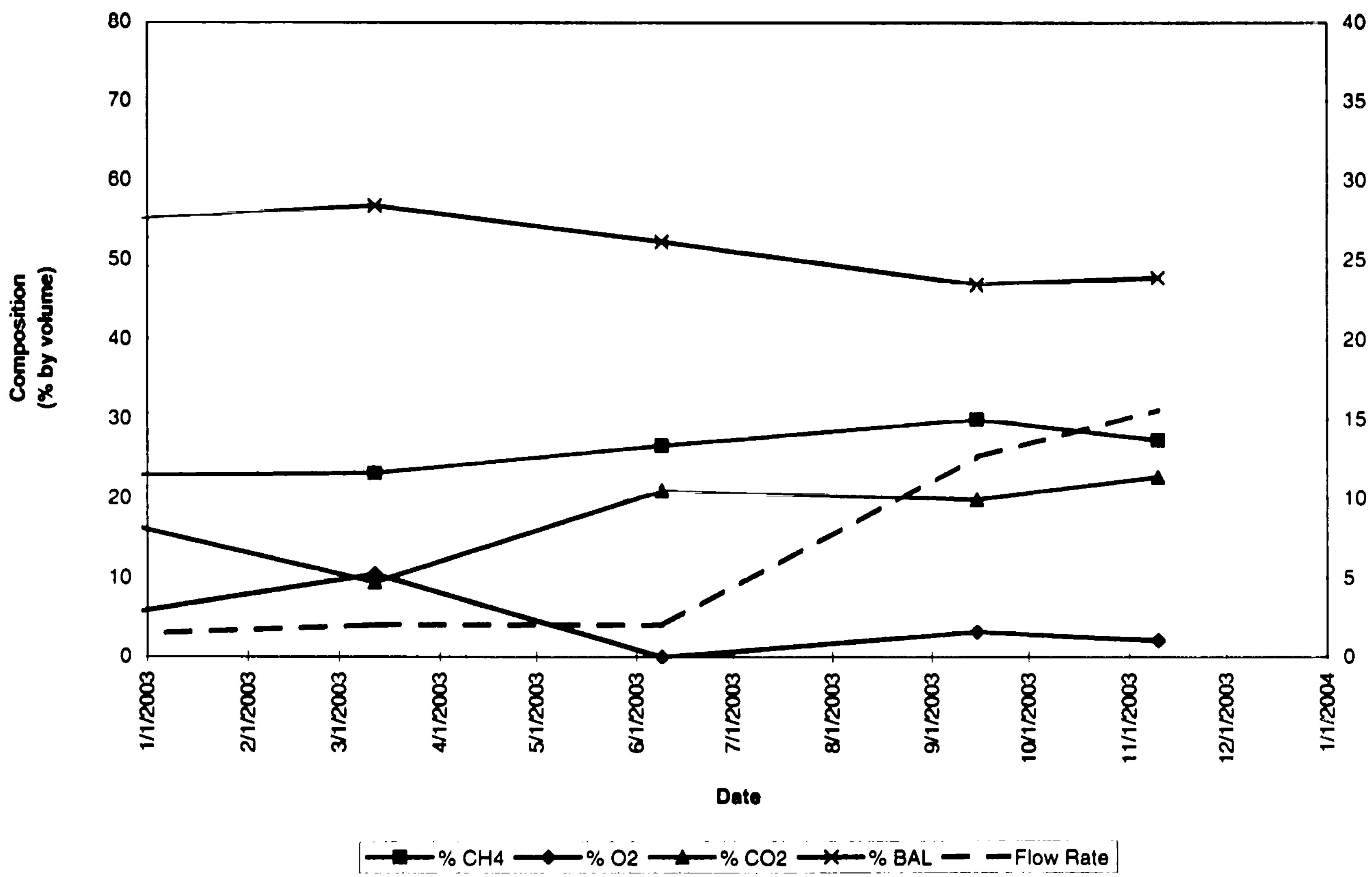

GW-28 Gas Composition and Flow for HOD Landfill
Composition (% by volume)
Flow Rate (scfm)
80
70
60
50
40
30
20
10
0
40
35
30
25
20
15
10
5
0
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
Date
% CH4
% O2
% CO2
% BAL
Flow Rate

26


GW-29 Gas Composition and Flow for HOD Landfill
Composition (% by volume)
Flow Rate (scfm)
Date
90
80
70
60
50
40
30
20
10
0
40
35
30
25
20
15
10
5
0
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
% CH4
% O2
% CO2
% BAL
Flow Rate

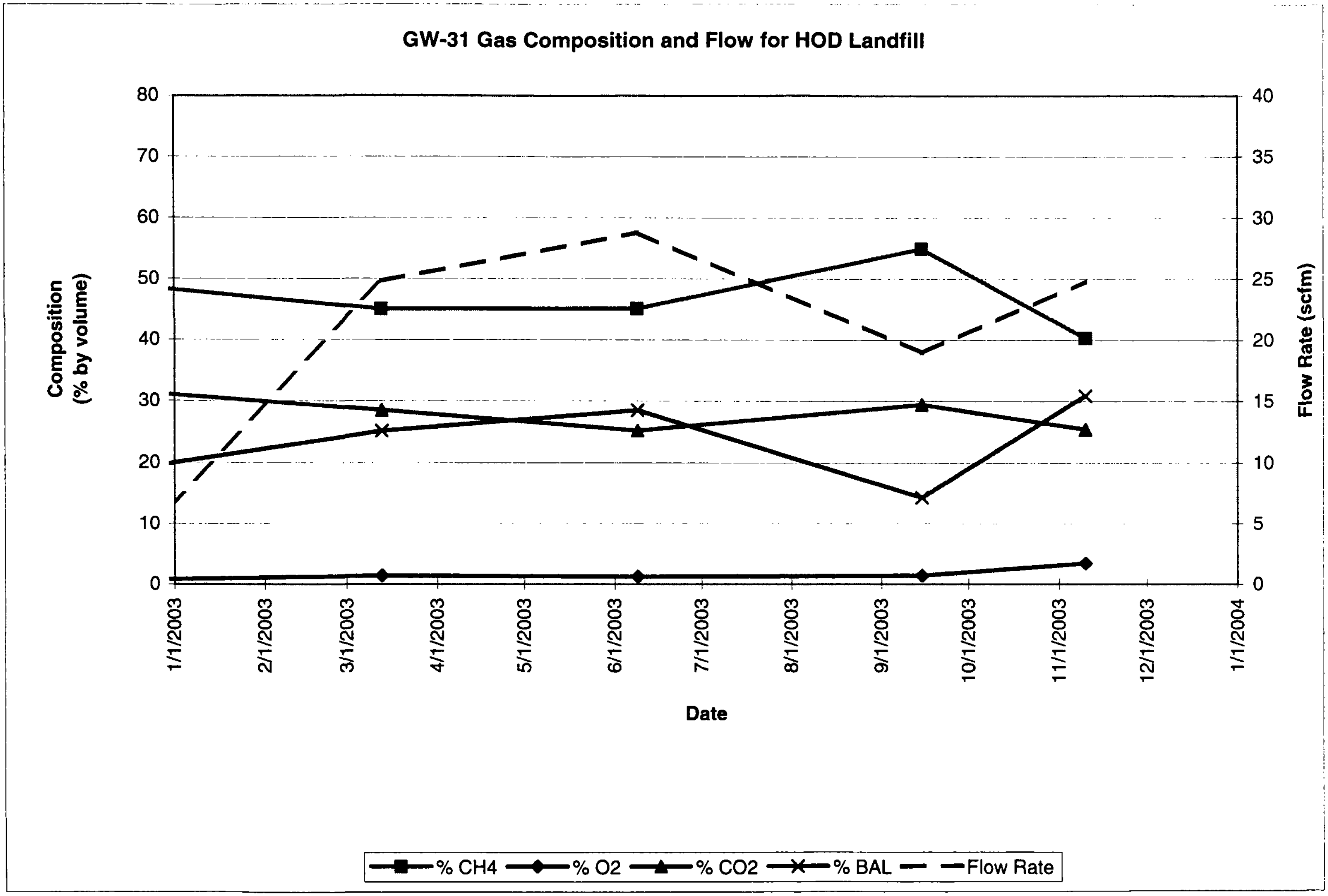
27

GW-30 Gas Composition and Flow for HOD Landfill

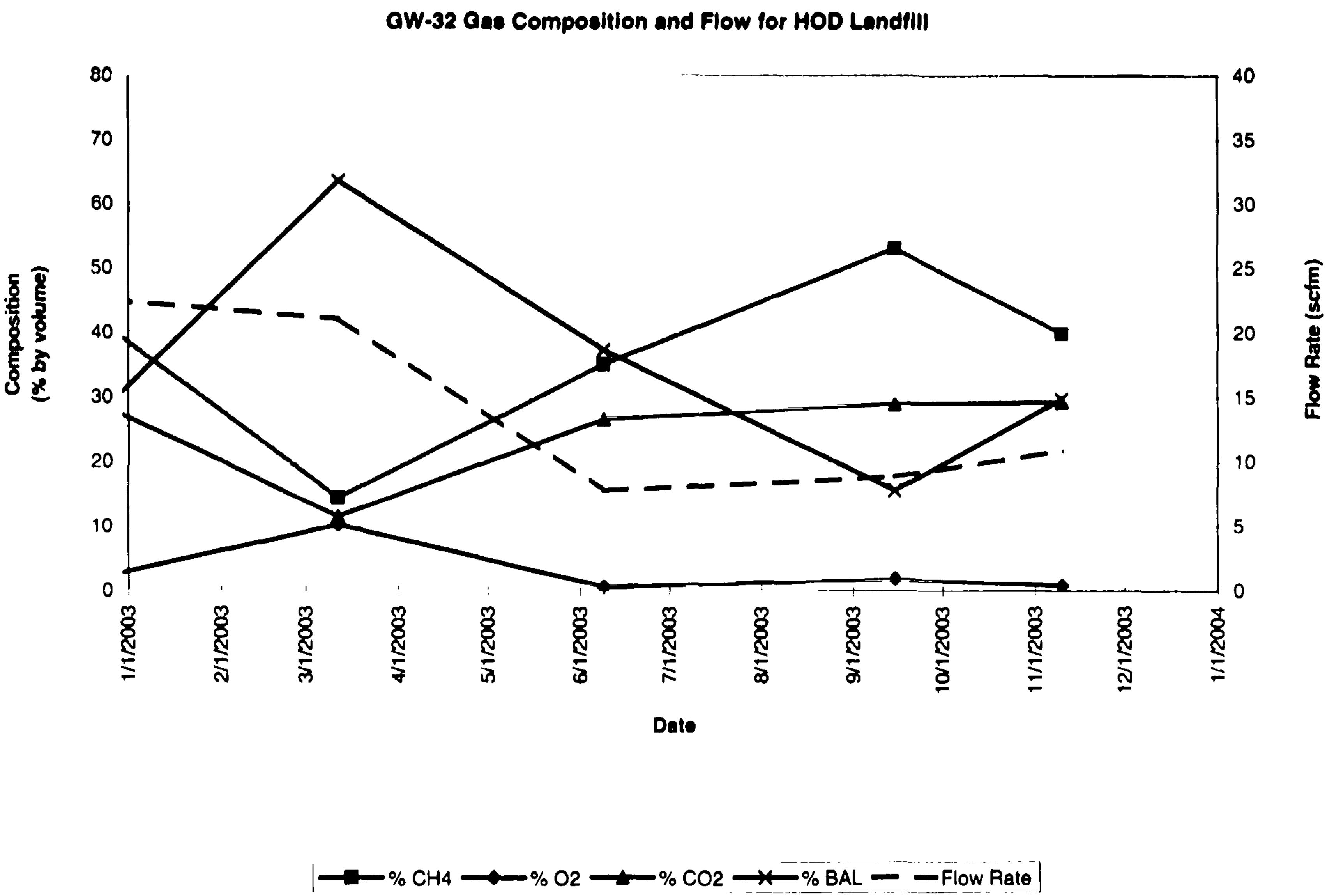


82

I:\WPMSN\PJT\00-05314\41\000531441-022.XLS 3/10/2004

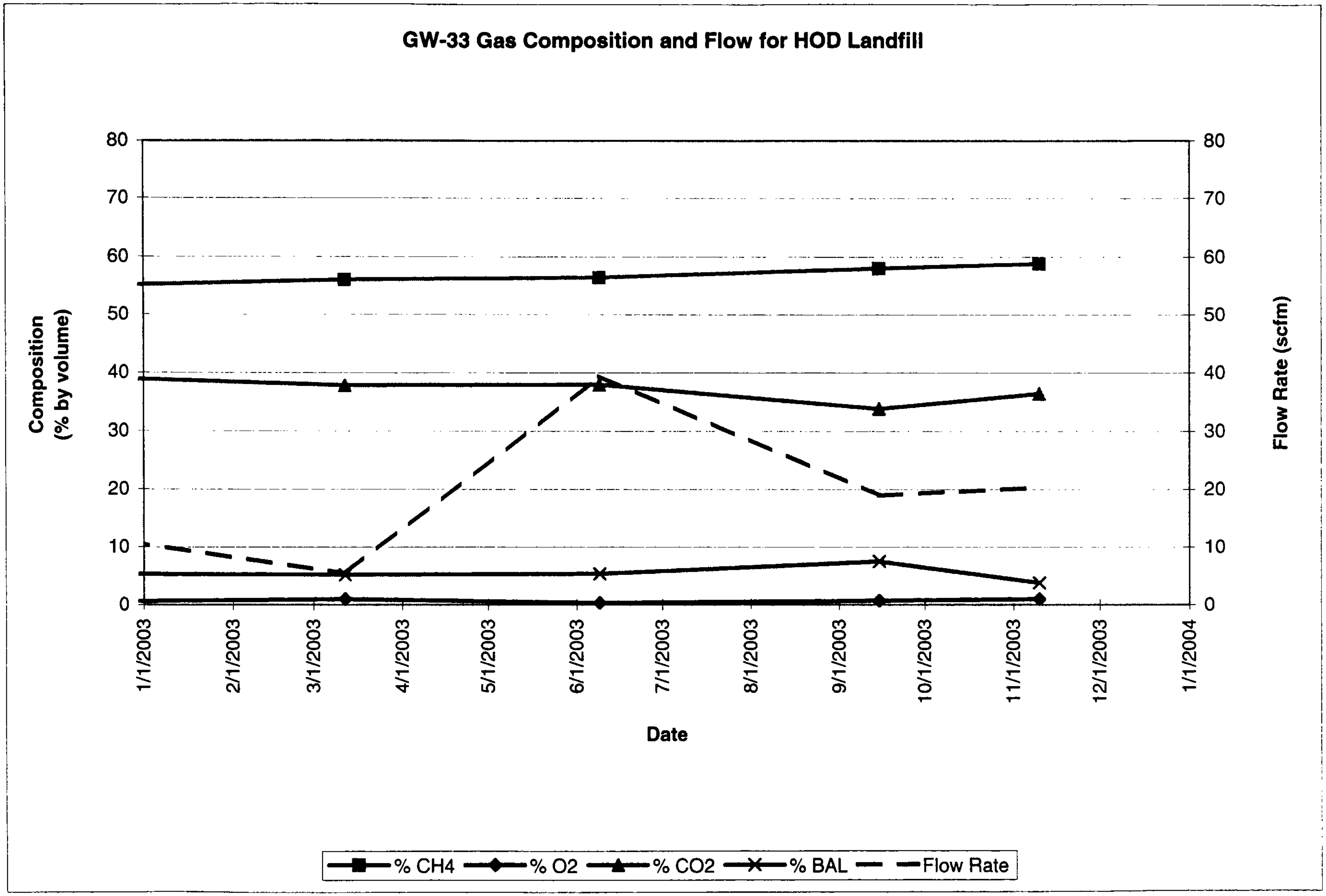

GW-31 Gas Composition and Flow for HOD Landfill
Composition (% by volume)
Flow Rate (scfm)
80
70
60
50
40
30
20
10
0
40
35
30
25
20
15
10
5
0
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
Date
% CH4
% O2
% CO2
% BAL
Flow Rate

29



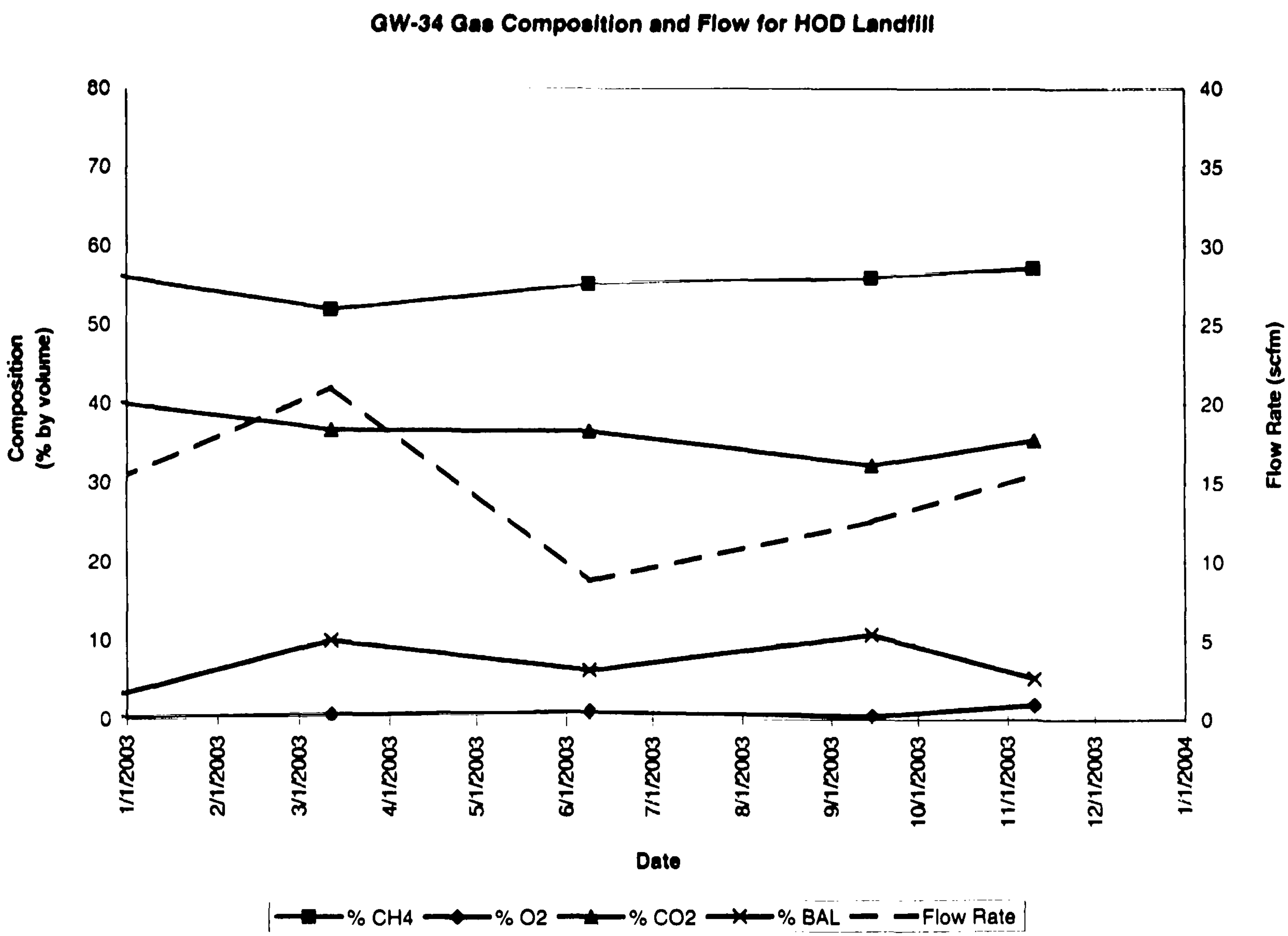
GW-32 Gas Composition and Flow for HOD Landfill
Composition (% by volume)
Flow Rate (scfm)
Date
80
70
60
50
40
30
20
10
0
40
35
30
25
20
15
10
5
0
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
% CH4
% O2
% CO2
% BAL
Flow Rate

30


GW-33 Gas Composition and Flow for HOD Landfill
Composition (% by volume)
Flow Rate (scfm)
80
70
60
50
40
30
20
10
0
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
Date
% CH4
% O2
% CO2
% BAL
Flow Rate

31

32



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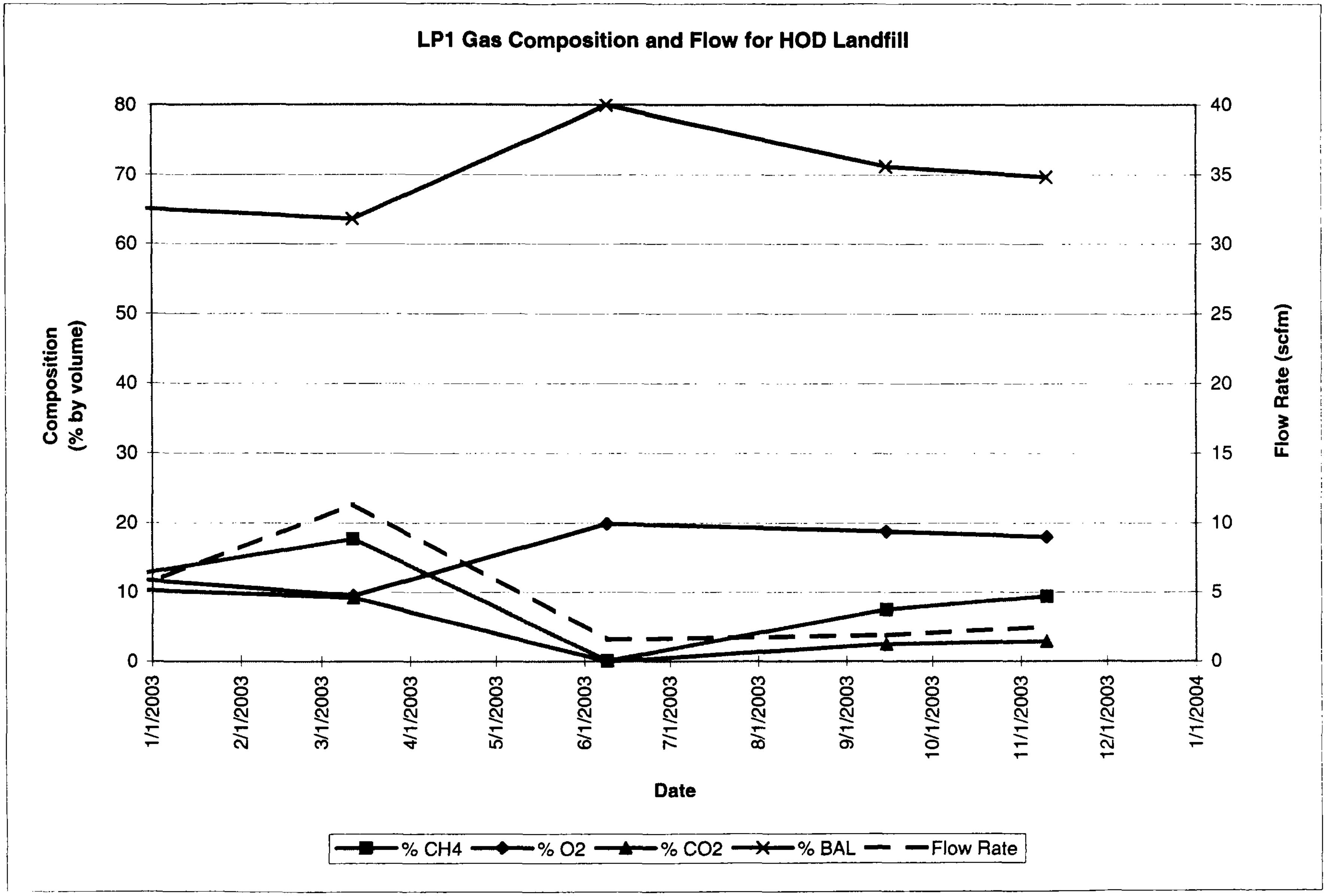
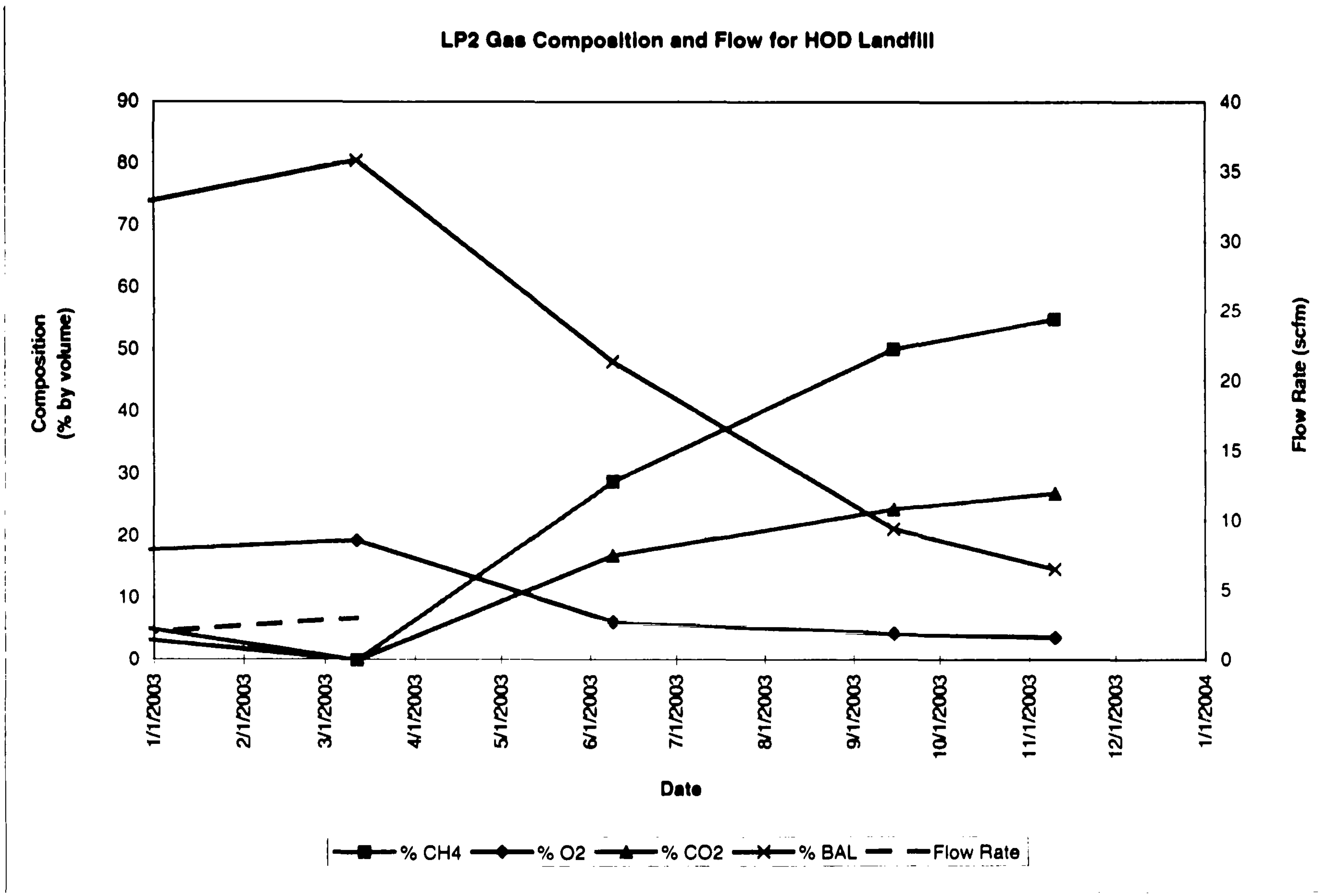


33

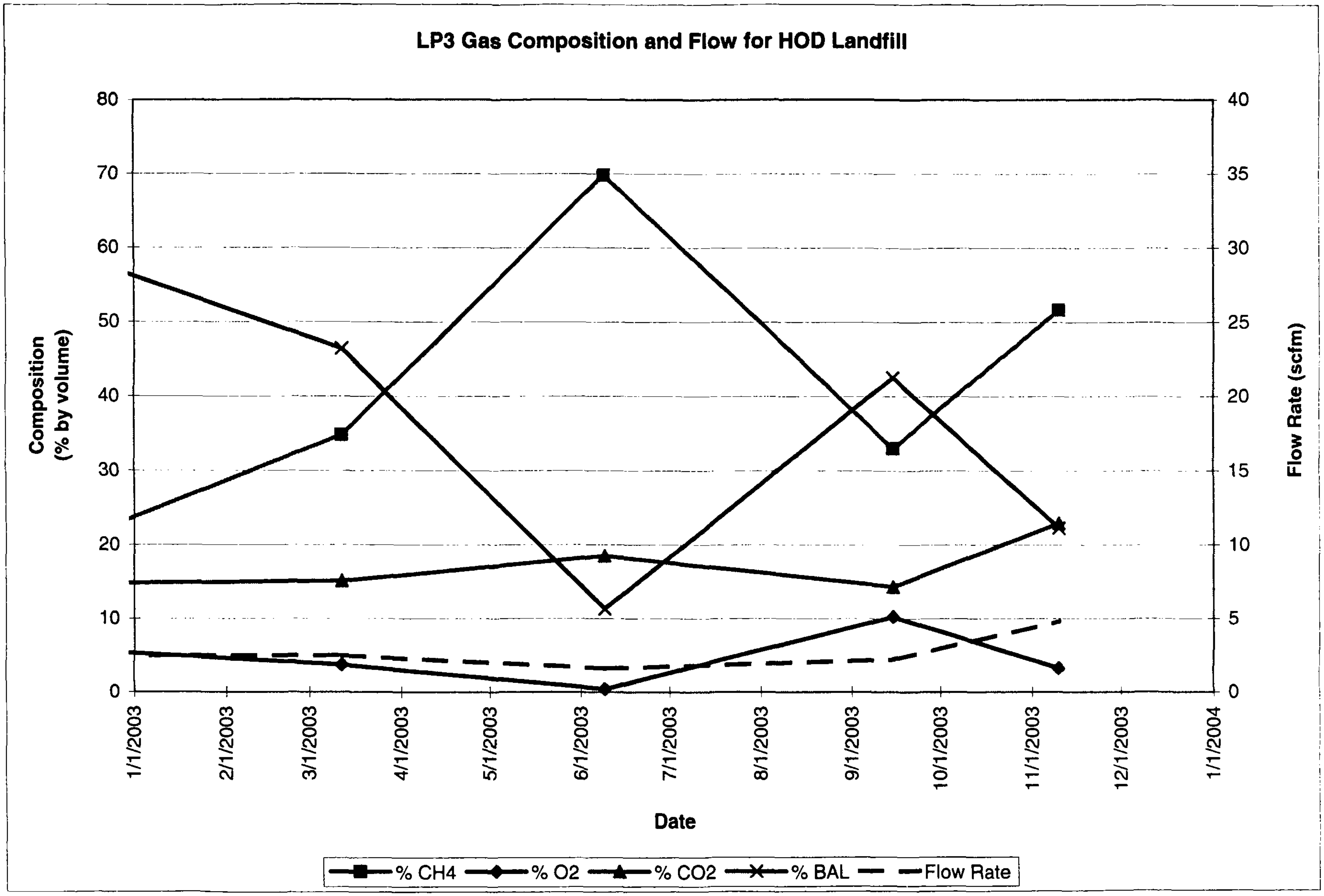
I:\WPMSN\PJT\00-05314\41\000531441-022.XLS 3/10/2004

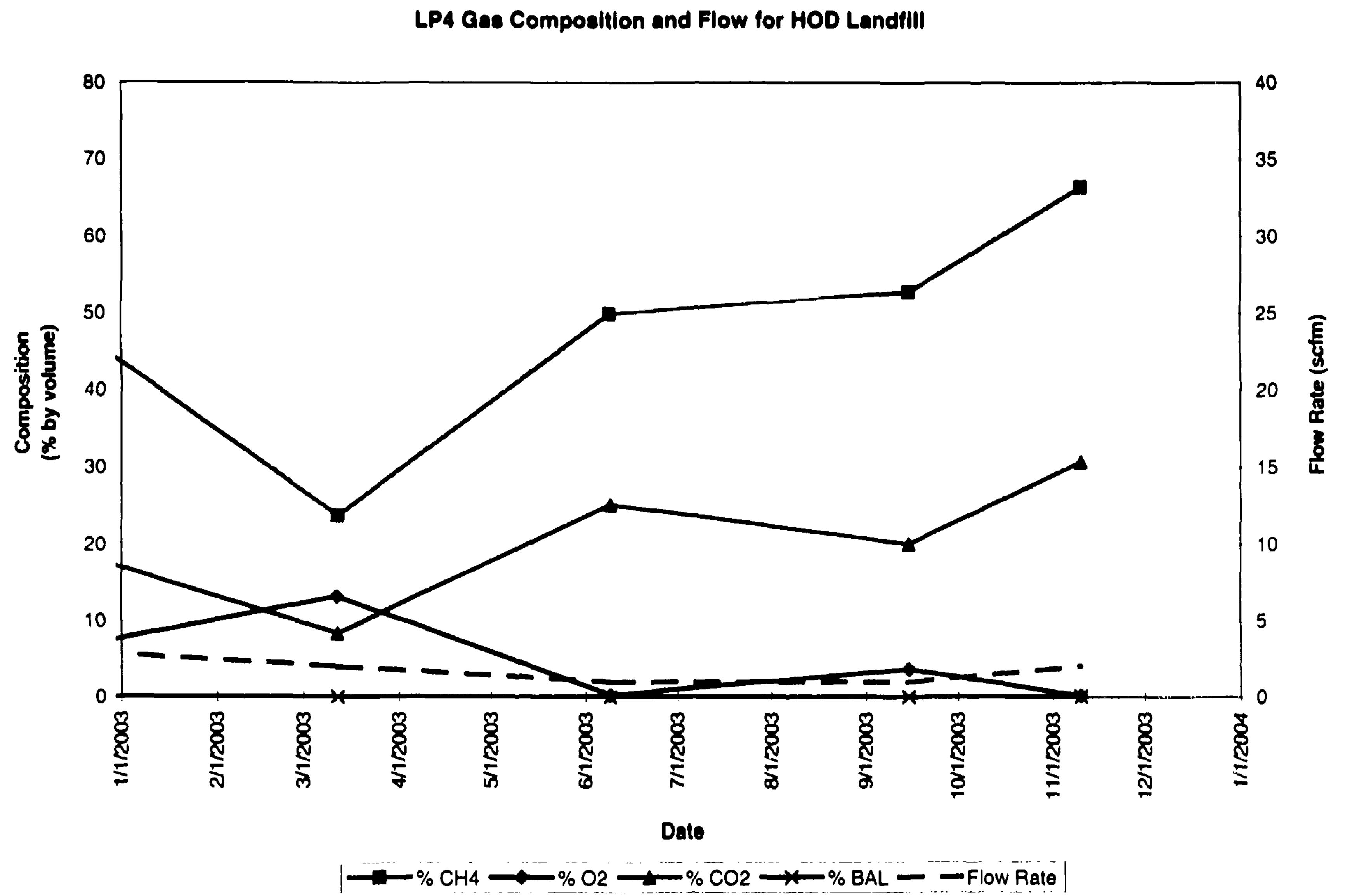


34

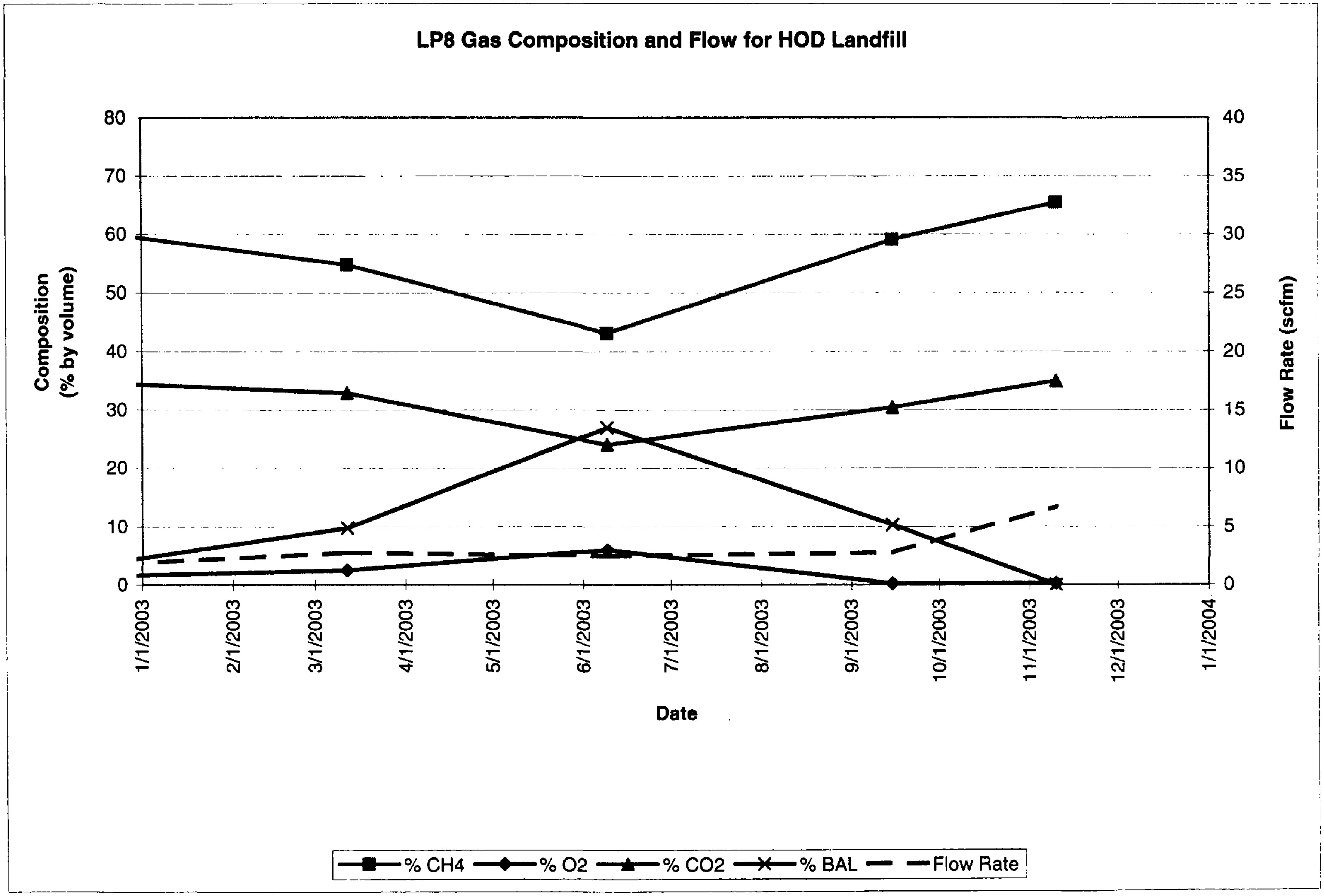
Note: Gas monitoring data was not collected during the June, September, and November 2003 monitoring periods, due sampling ports by the orifice plate that were not operating properly.

I:\WPMSN\PJT\00-05314\41\000531441-022.XLS 3/10/2004


LP3 Gas Composition and Flow for HOD Landfill
Composition (% by volume)
Flow Rate (scfm)
80
70
60
50
40
30
20
10
0
40
35
30
25
20
15
10
5
0
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
Date
% CH4
% O2
% CO2
% BAL
Flow Rate

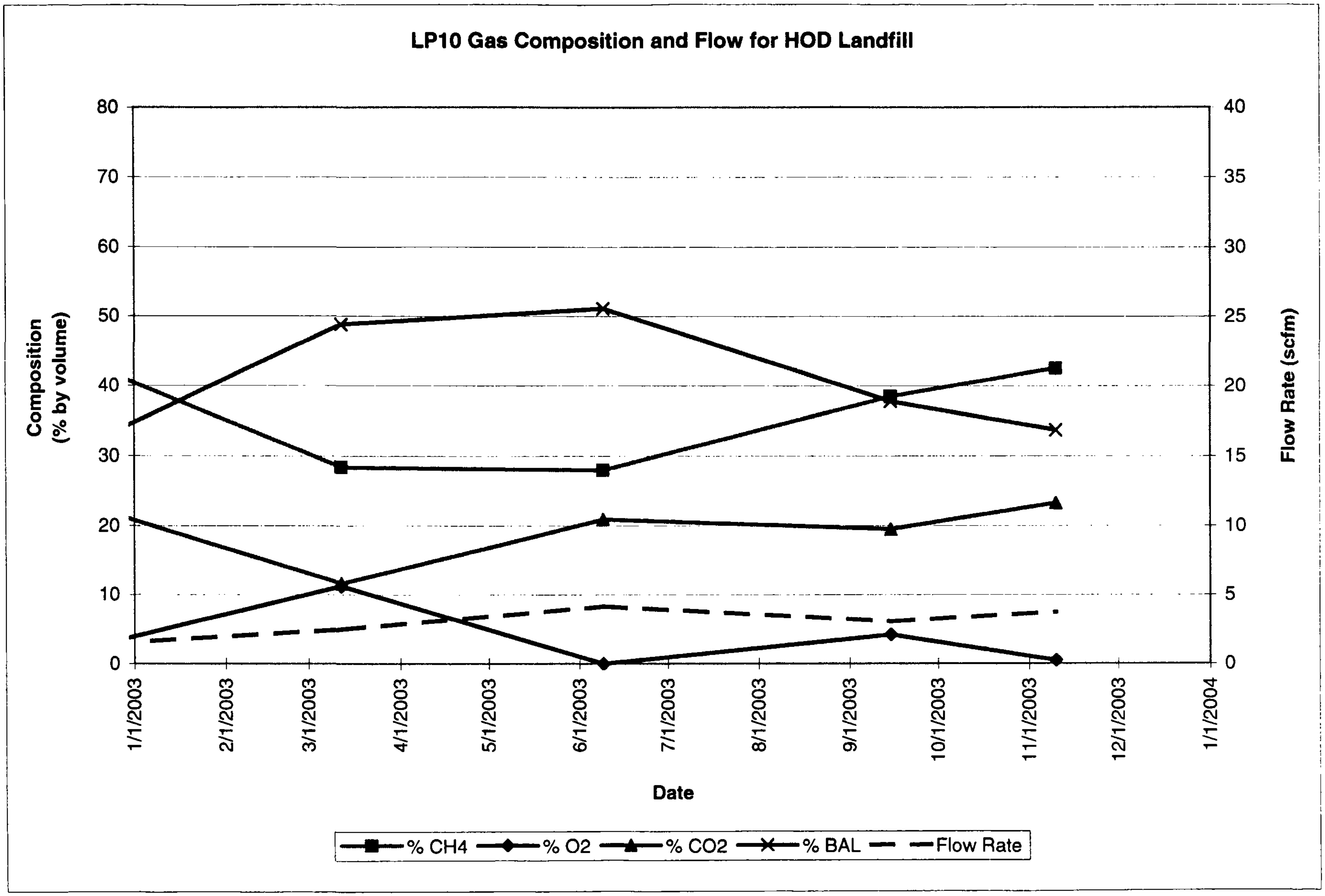


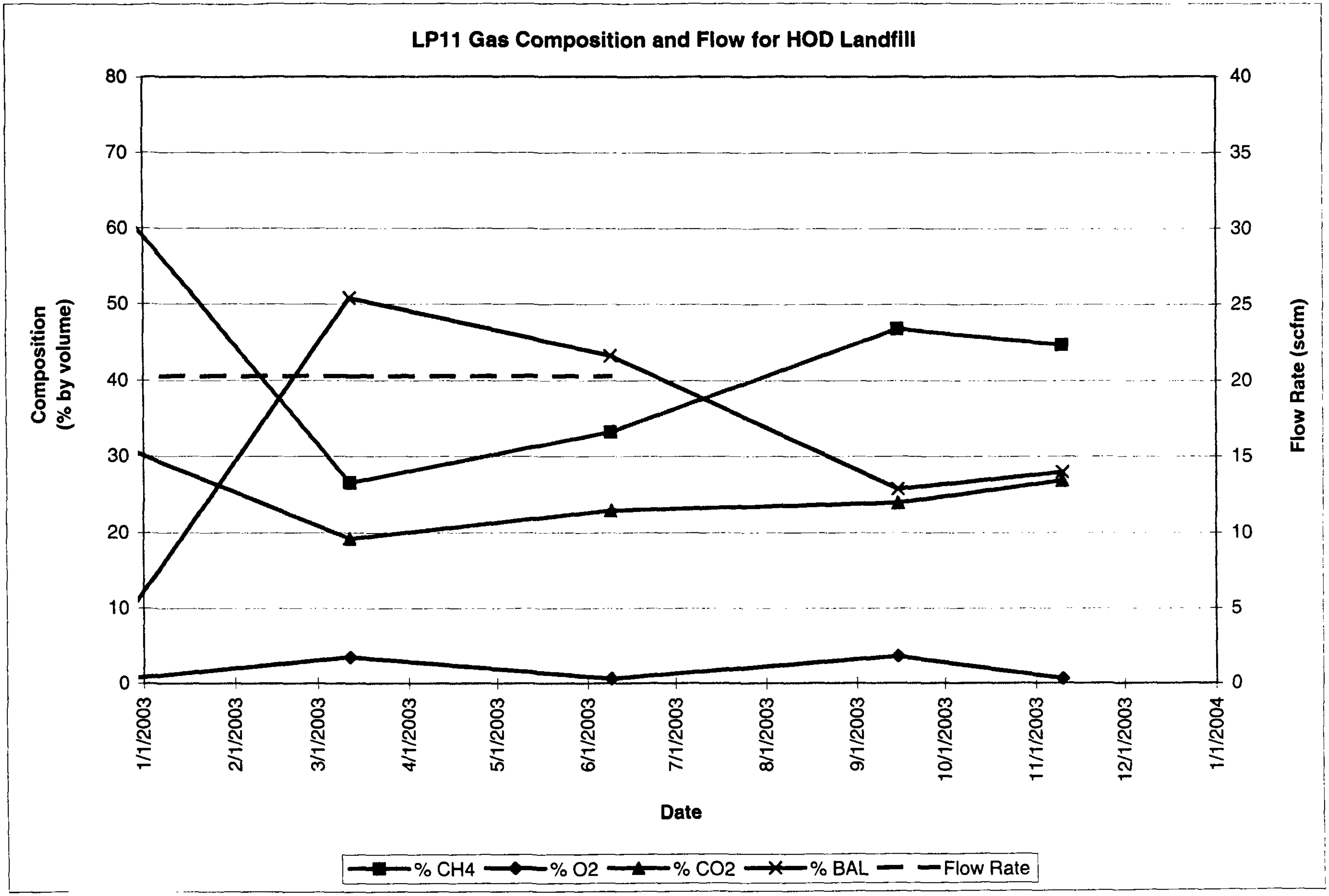
I:\WPMSN\PJT\00-05314\41\000531441-022 XLS 3/10/2004



LP8 Gas Composition and Flow for HOD Landfill
Composition (% by volume)
Flow Rate (scfm)
80
70
60
50
40
30
20
10
0
40
35
30
25
20
15
10
5
0
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
Date
% CH4
% O2
% CO2
% BAL
Flow Rate

37

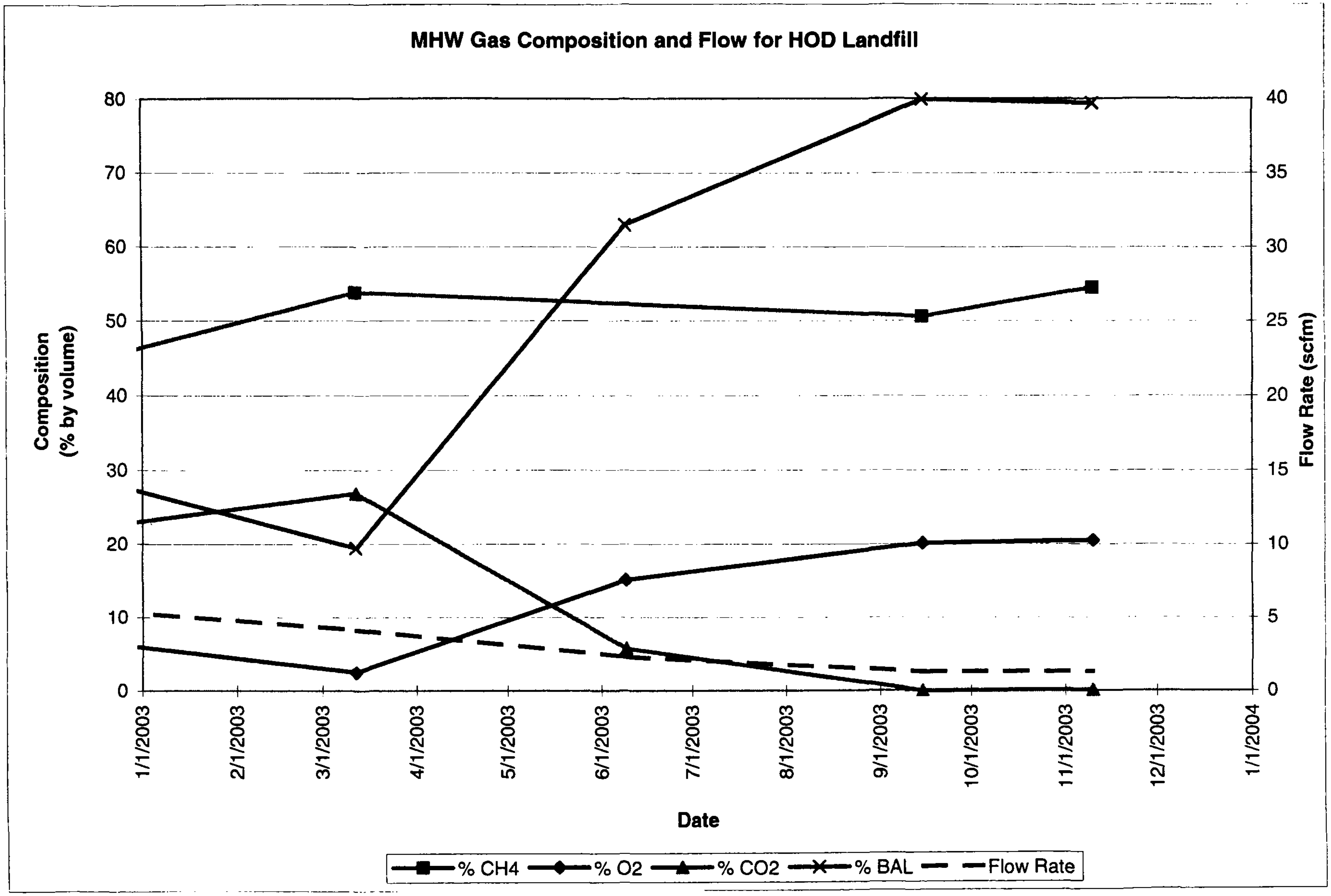

LP10 Gas Composition and Flow for HOD Landfill
Composition (% by volume)
Flow Rate (scfm)
80
70
60
50
40
30
20
10
0
40
35
30
25
20
15
10
5
0
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
Date
% CH4
% O2
% CO2
% BAL
Flow Rate



39

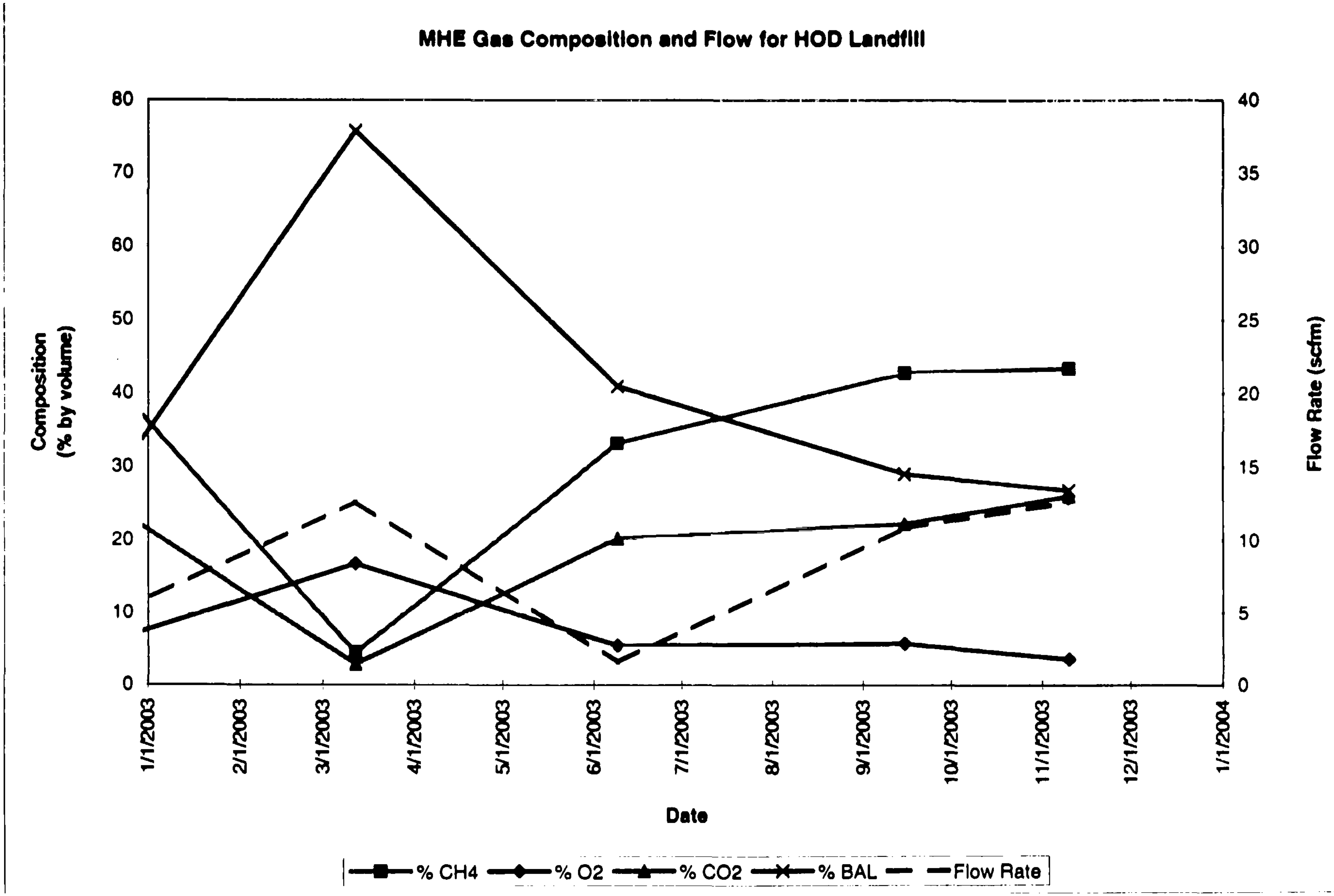
Well LP11 flow rate was not measured during the September or November sampling period due to broken wellhead connectors.

I:\WPMSN\PJT\00-05314\41\000531441-022.XLS 3/10/2004



44

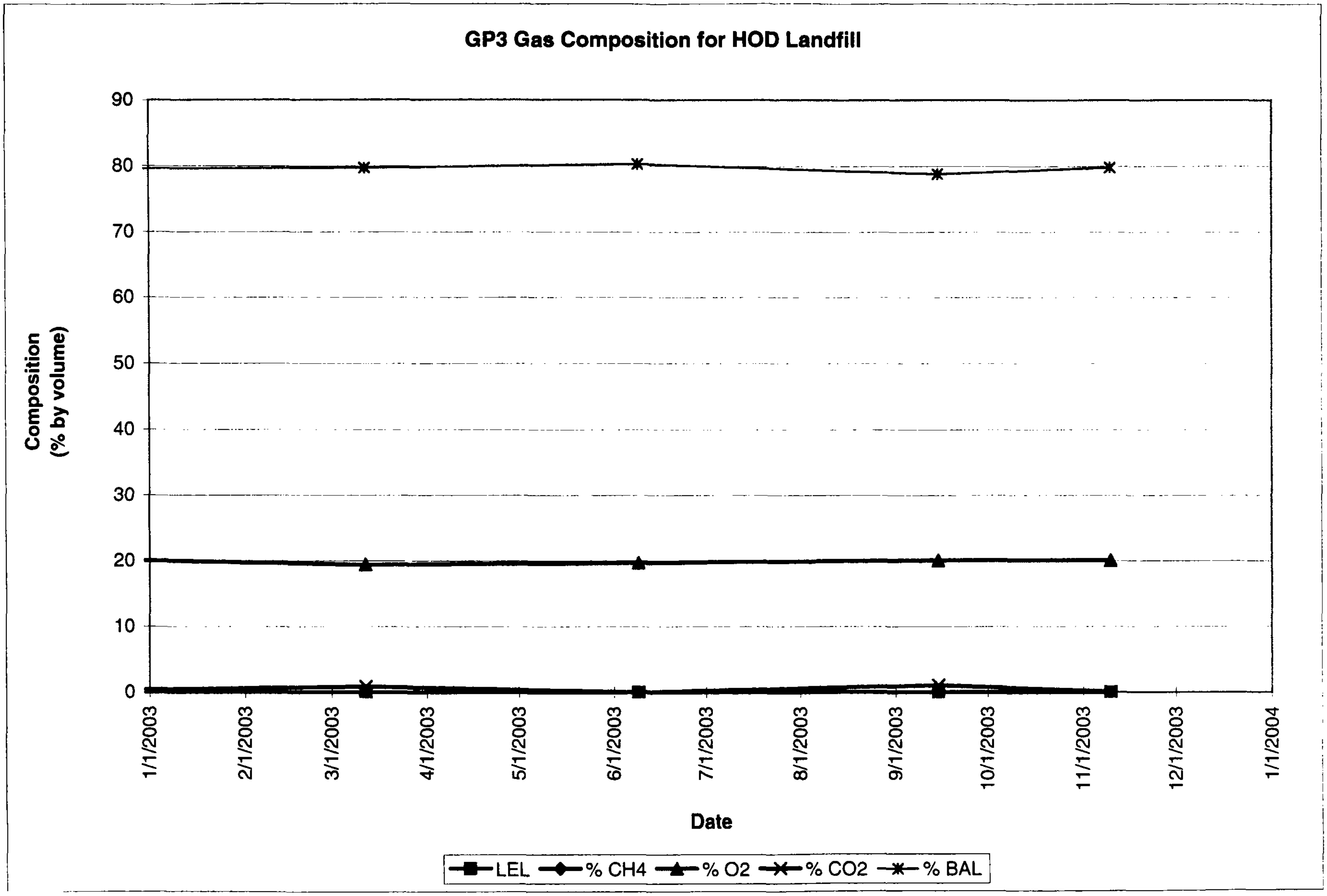
I:\WPMSN\PJT\00-05314\41\000531441-022.XLS 4/23/2004


MHE Gas Composition and Flow for HOD Landfill
Composition (% by volume)
Flow Rate (scfm)
0
10
20
30
40
50
60
70
80
0
5
10
15
20
25
30
35
40
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
Date
% CH4
% O2
% CO2
% BAL
Flow Rate

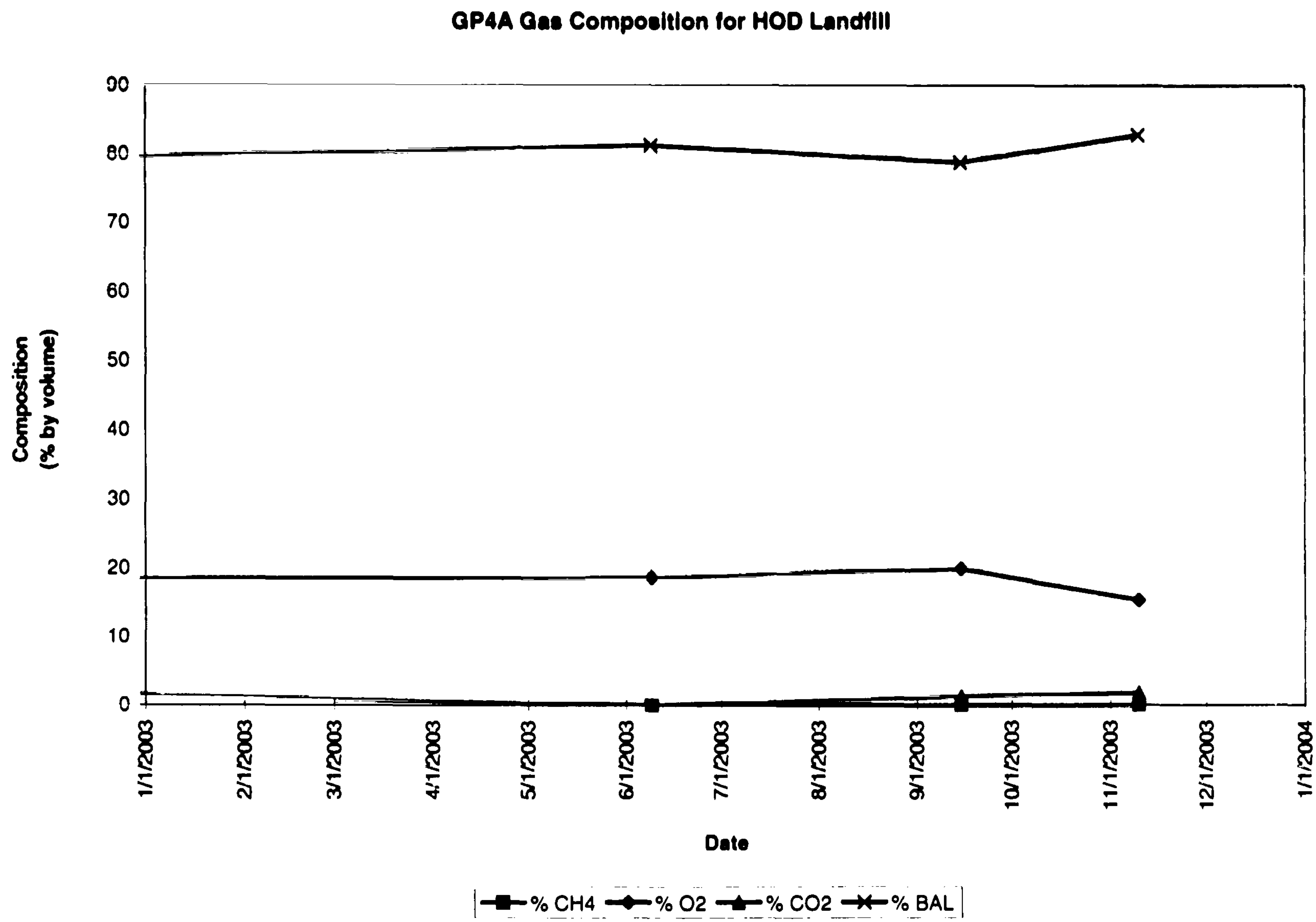
47

Gas Probes

#

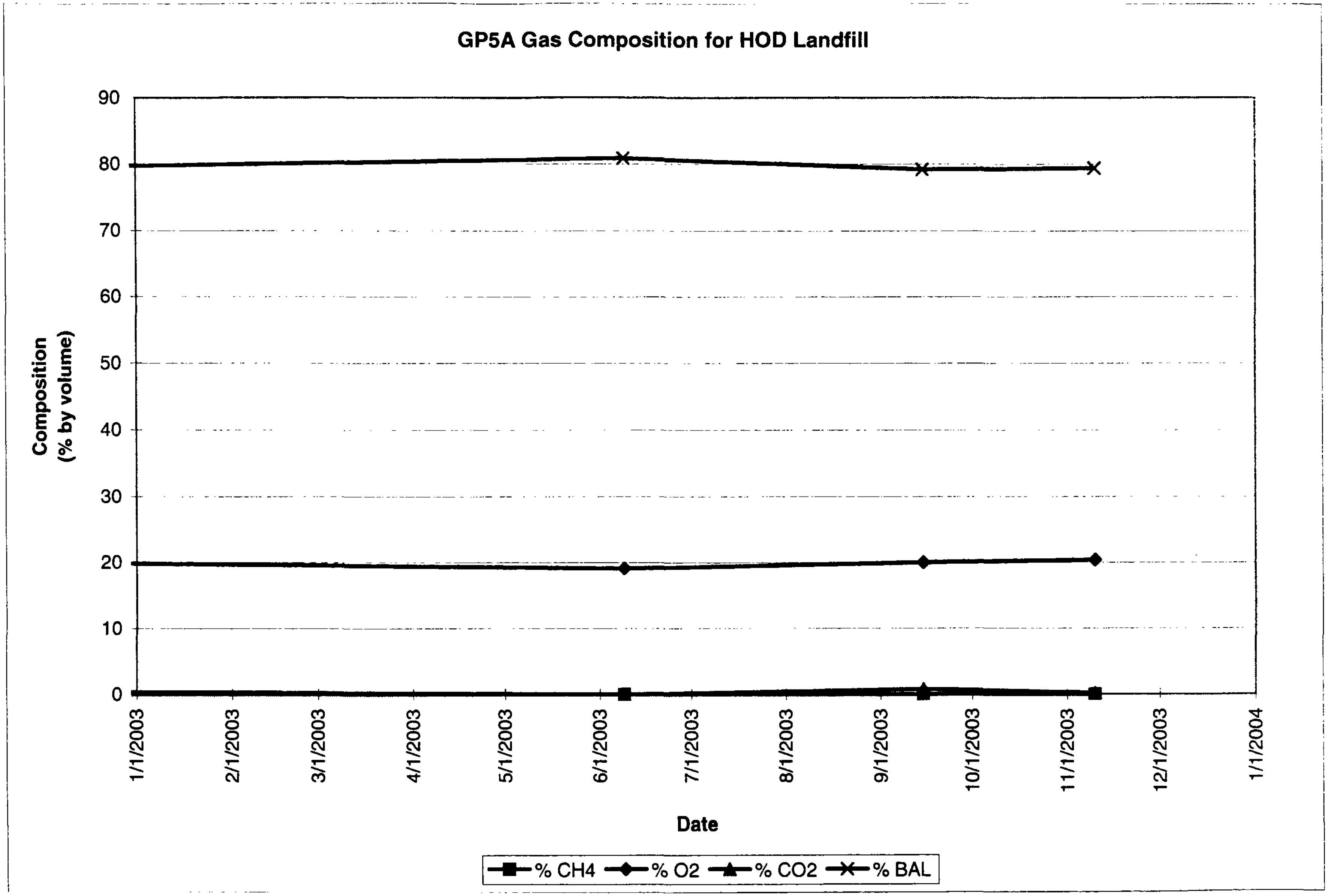


GP3 Gas Composition for HOD Landfill
Composition (% by volume)
90
80
70
60
50
40
30
20
10
0
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
Date
LEL
% CH4
% O2
% CO2
% BAL

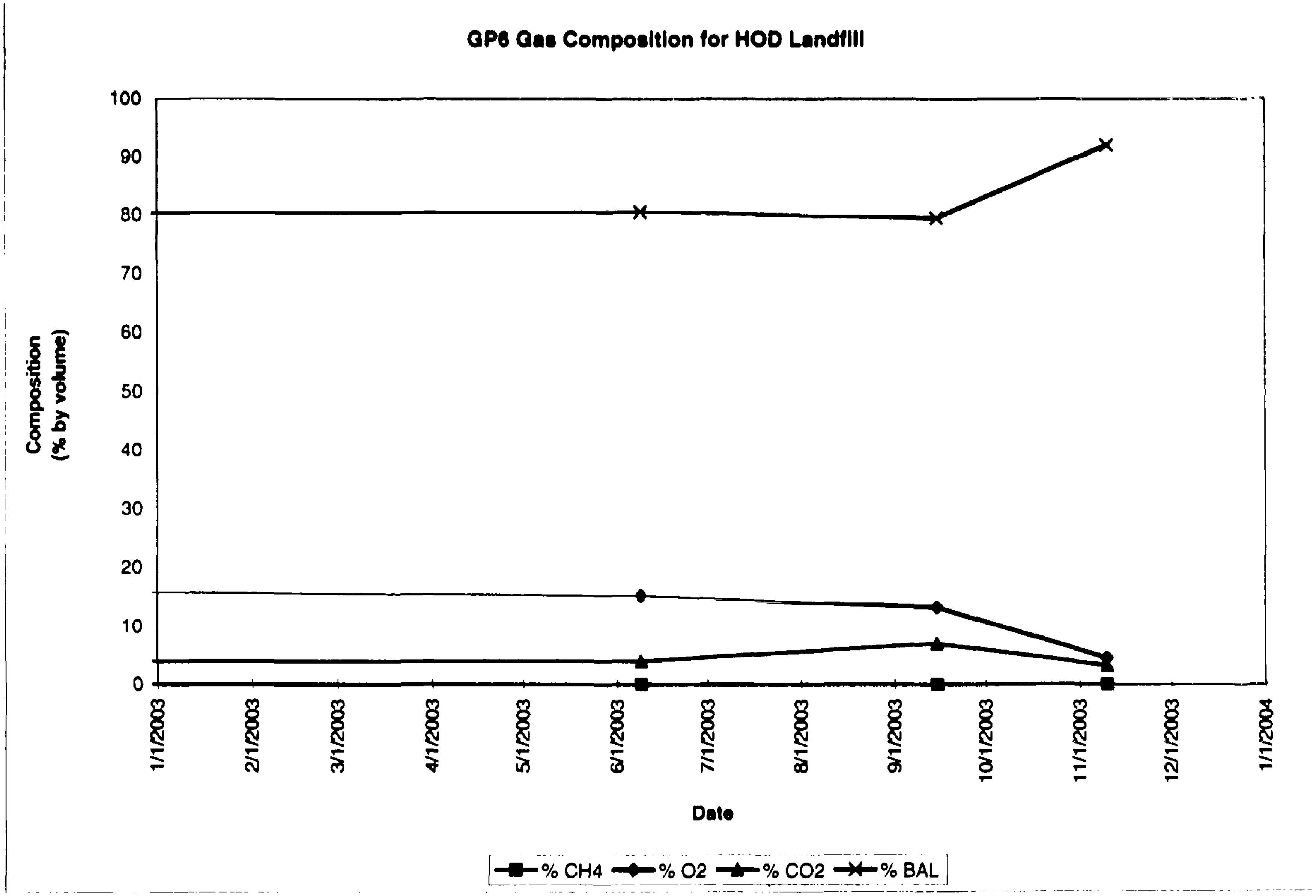


46

I:\WPMSN\PJT\00-05314\41\000531441-022 XLS 3/10/2004

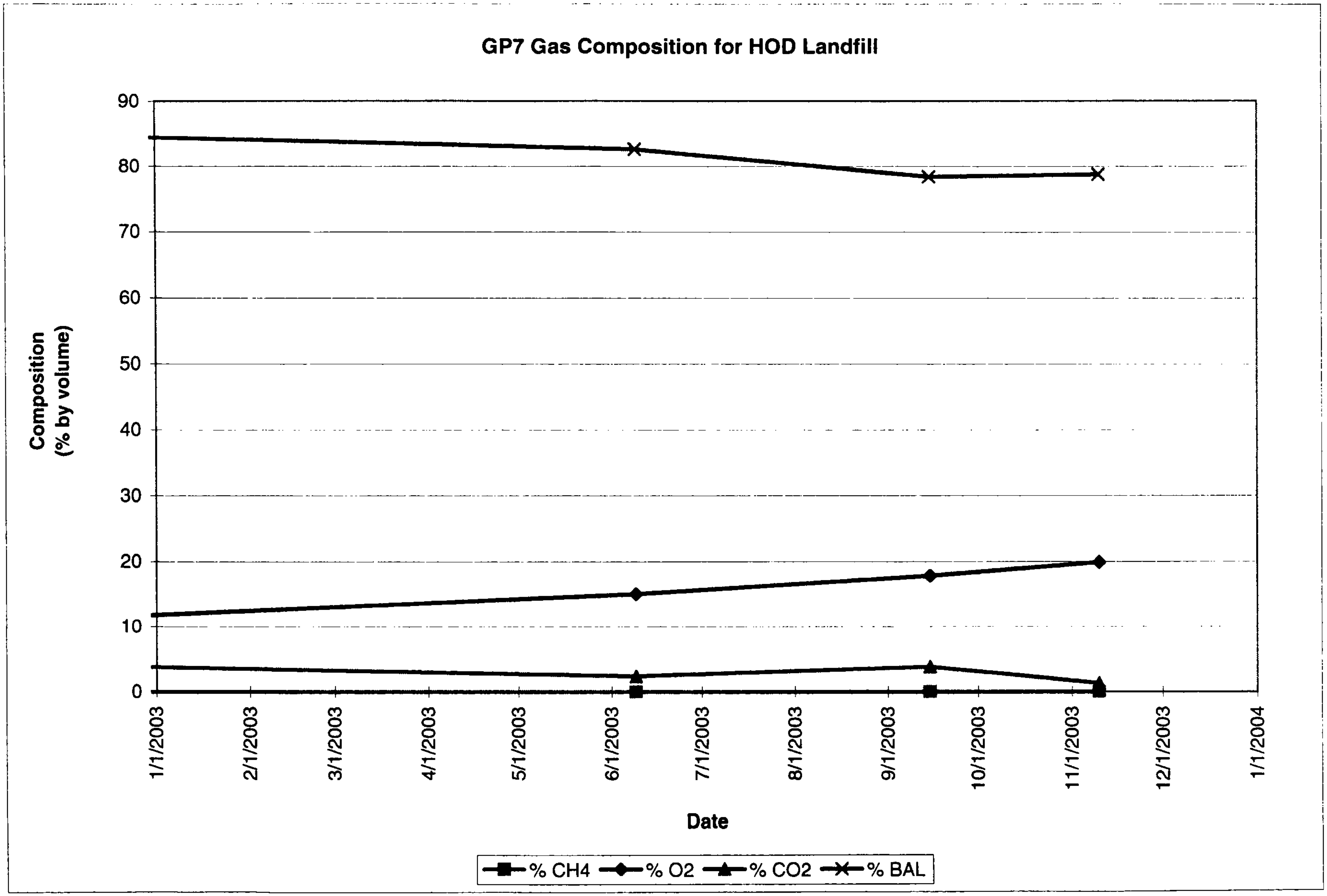

GP5A Gas Composition for HOD Landfill
Composition
(% by volume)
90
80
70
60
50
40
30
20
10
0
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
Date
% CH4
% O2
% CO2
% BAL

47

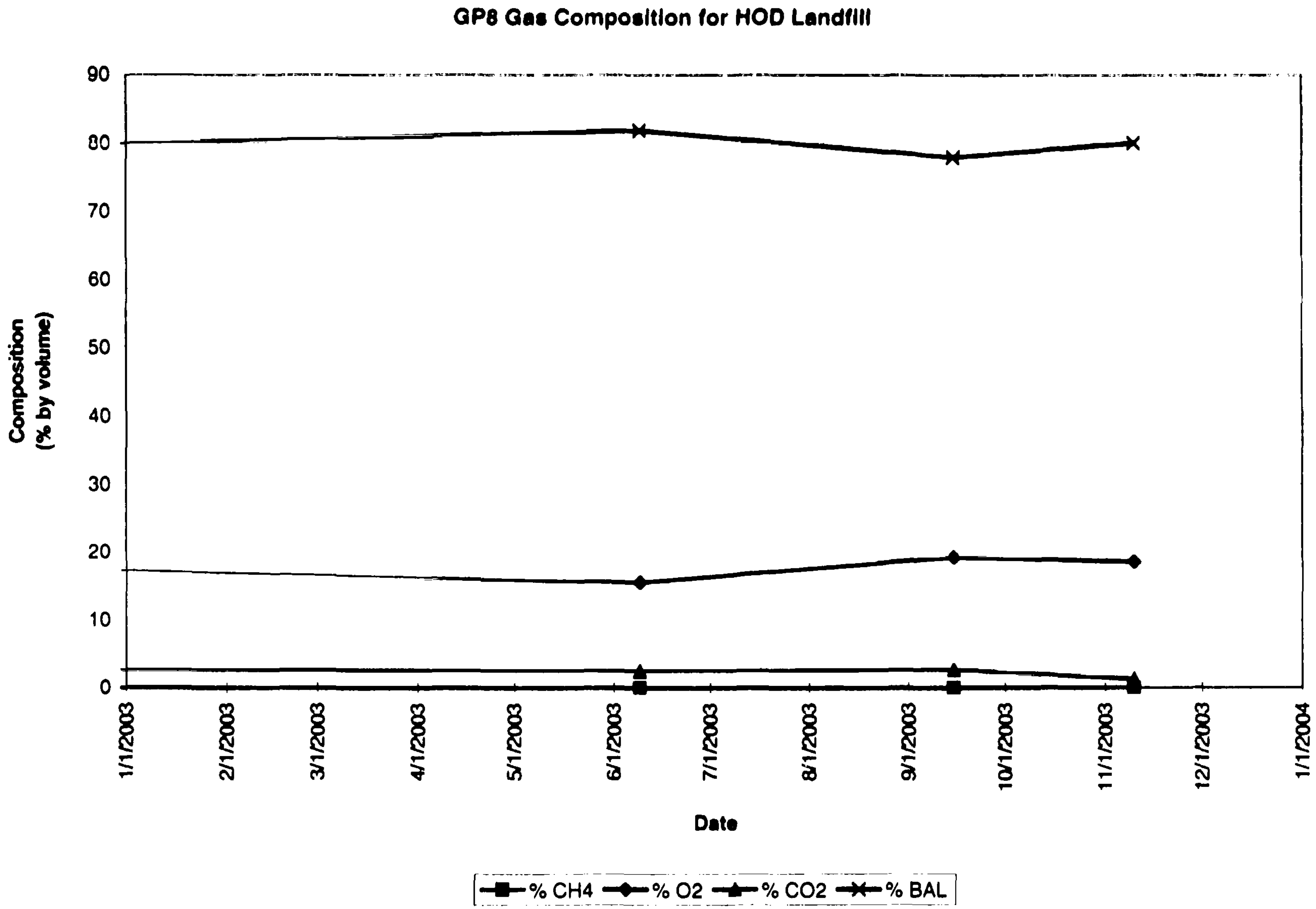


GP6 Gas Composition for HOD Landfill
100
90
80
70
60
50
40
30
20
10
0
Composition
(% by volume)
1/1/2003
2/1/2003
3/1/2003
4/1/2003
5/1/2003
6/1/2003
7/1/2003
8/1/2003
9/1/2003
10/1/2003
11/1/2003
12/1/2003
1/1/2004
Date
% CH4
% O2
% CO2
% BAL

48



I:\WPMSN\PJT\00-05314\41\000531441-022.XLS 3/10/2004



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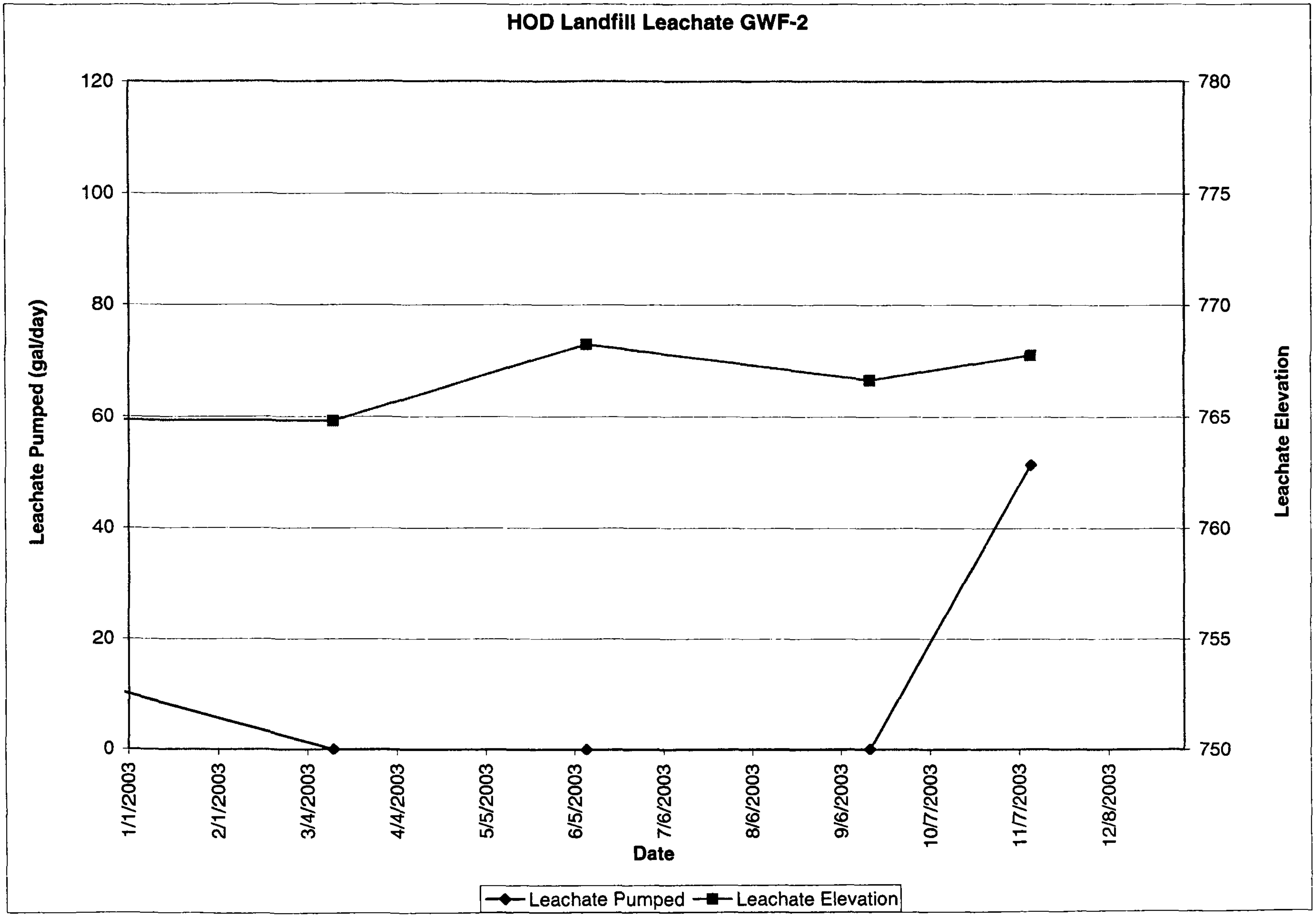
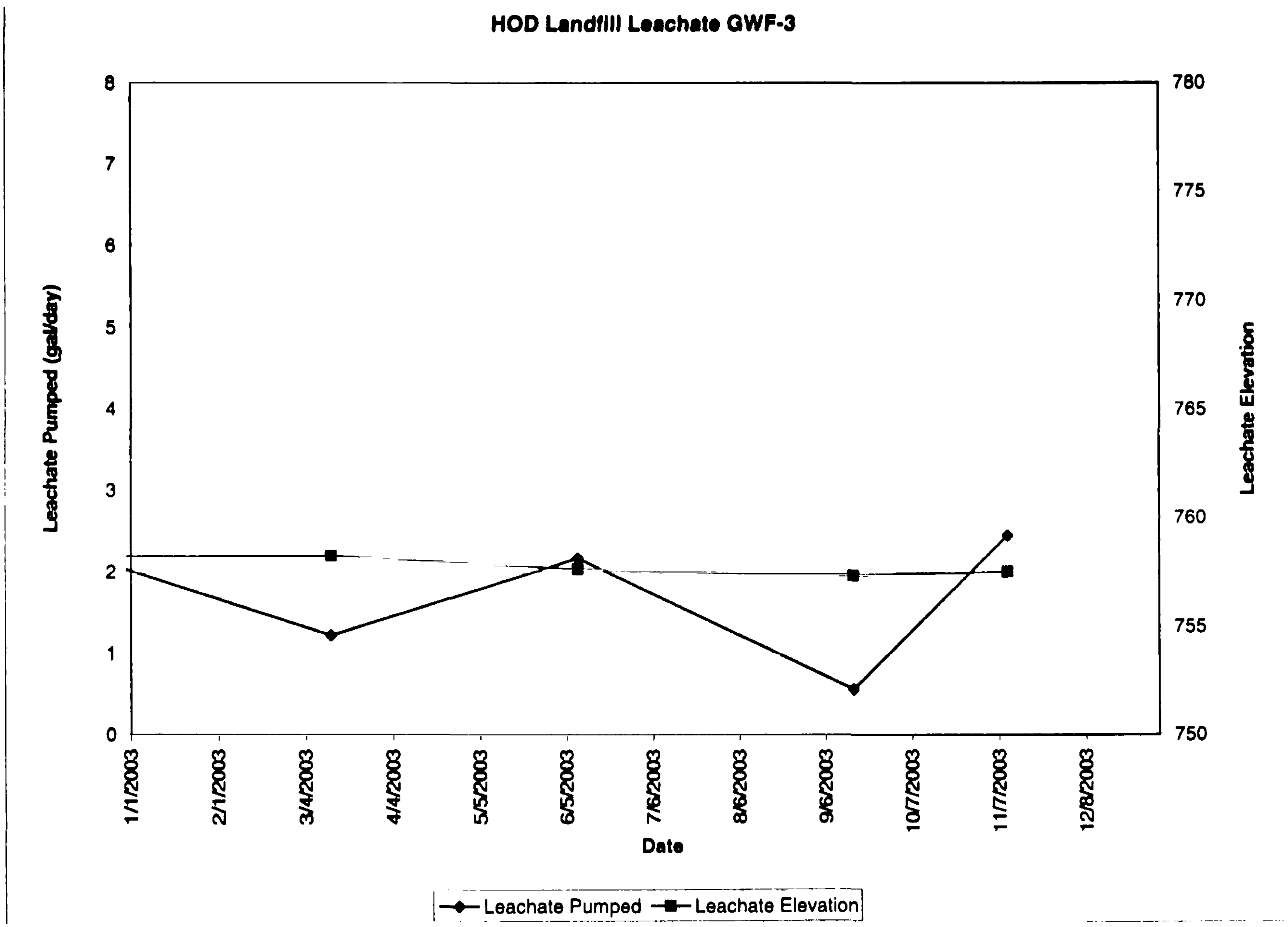
Appendix C
Leachate Monitoring Data

Leachate Extraction Wells



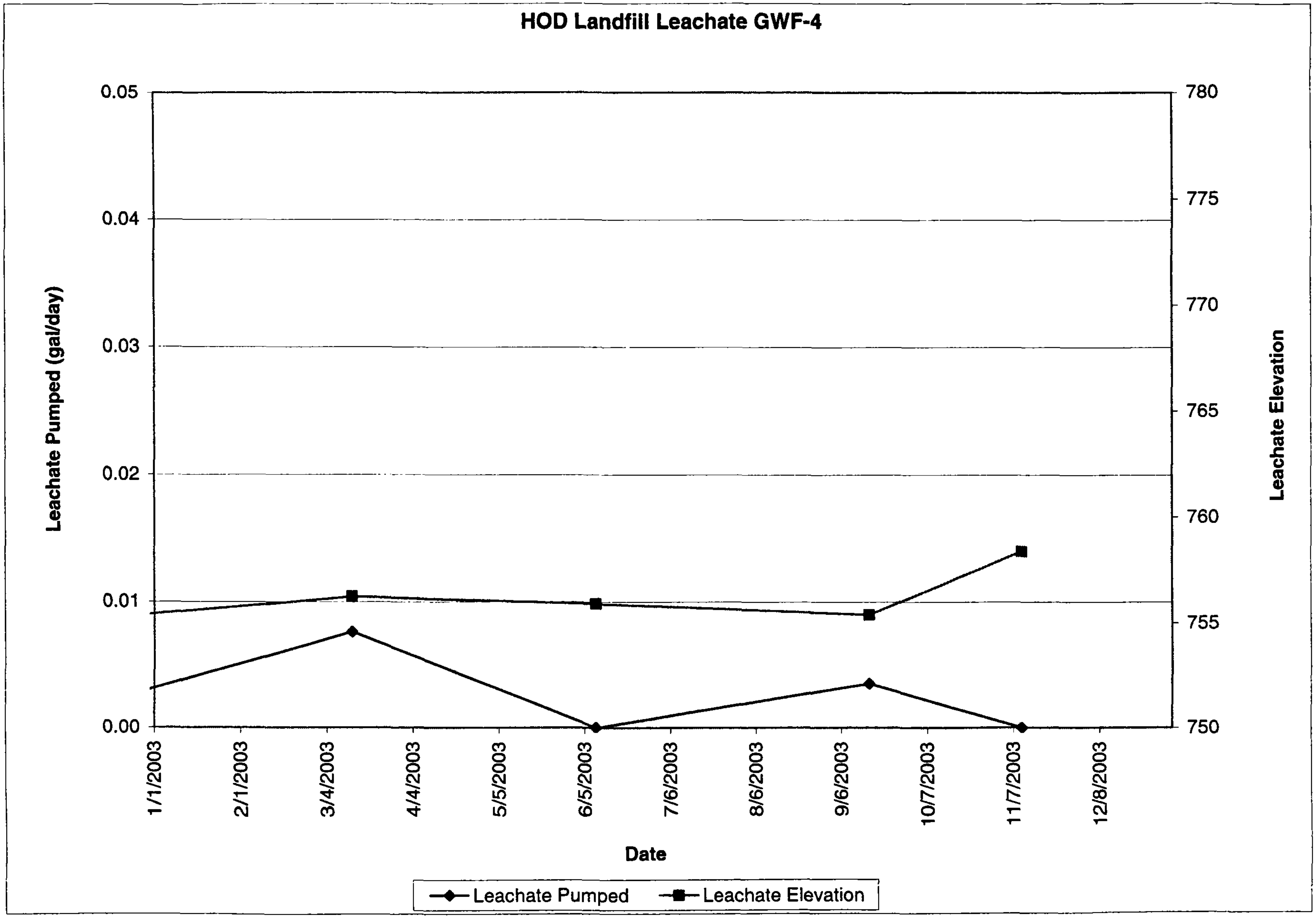
3

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004



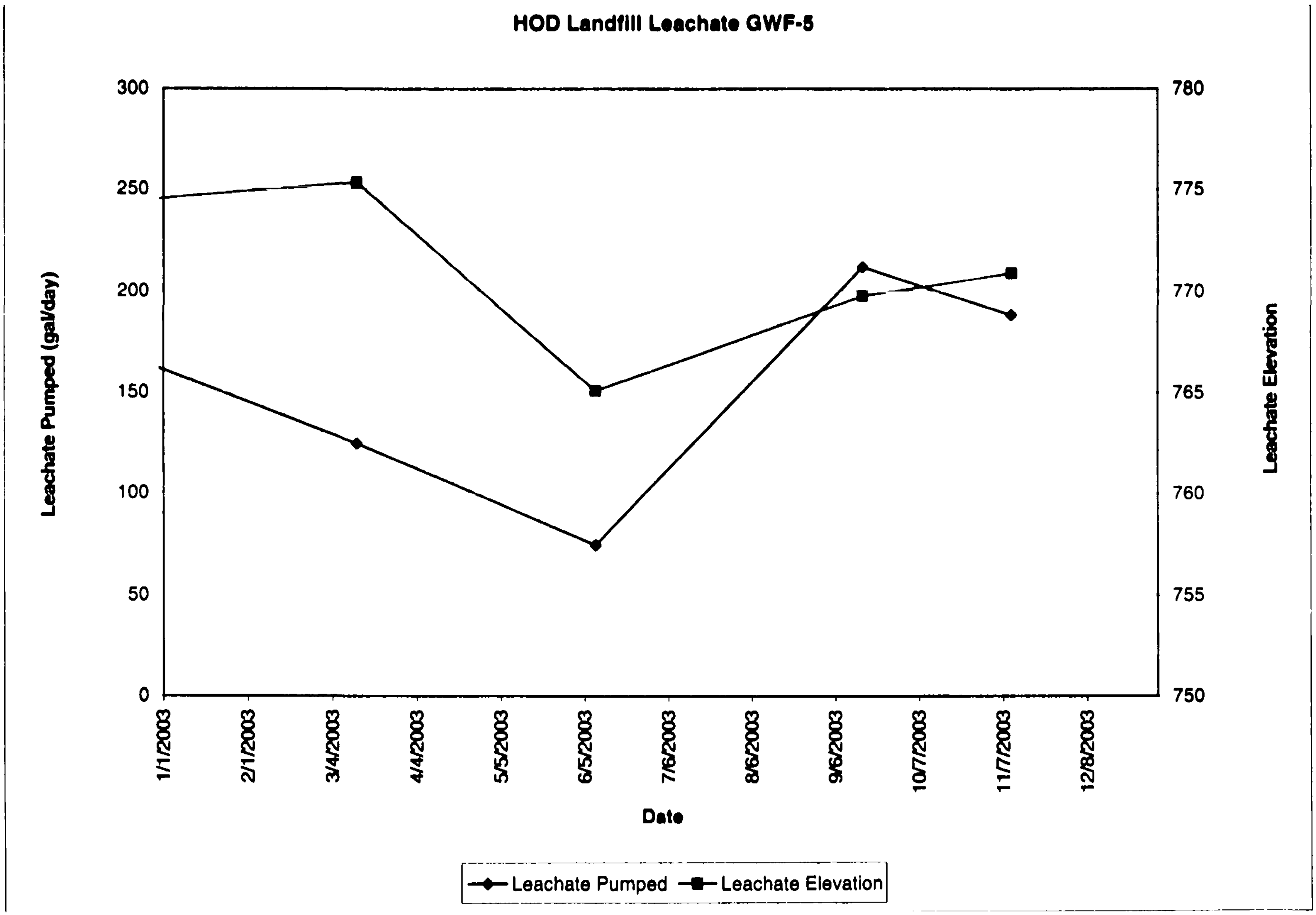
4

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004

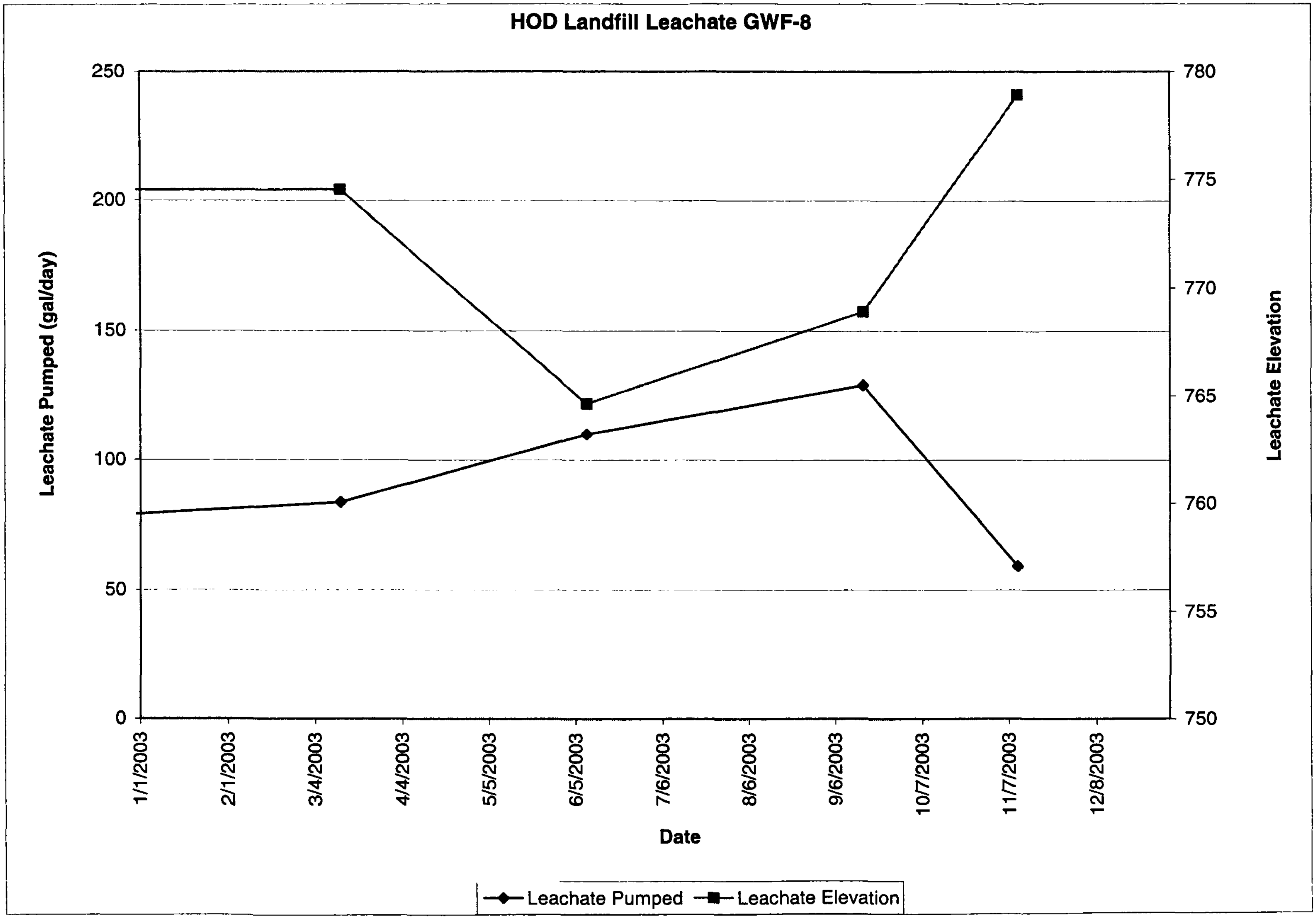


5

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004



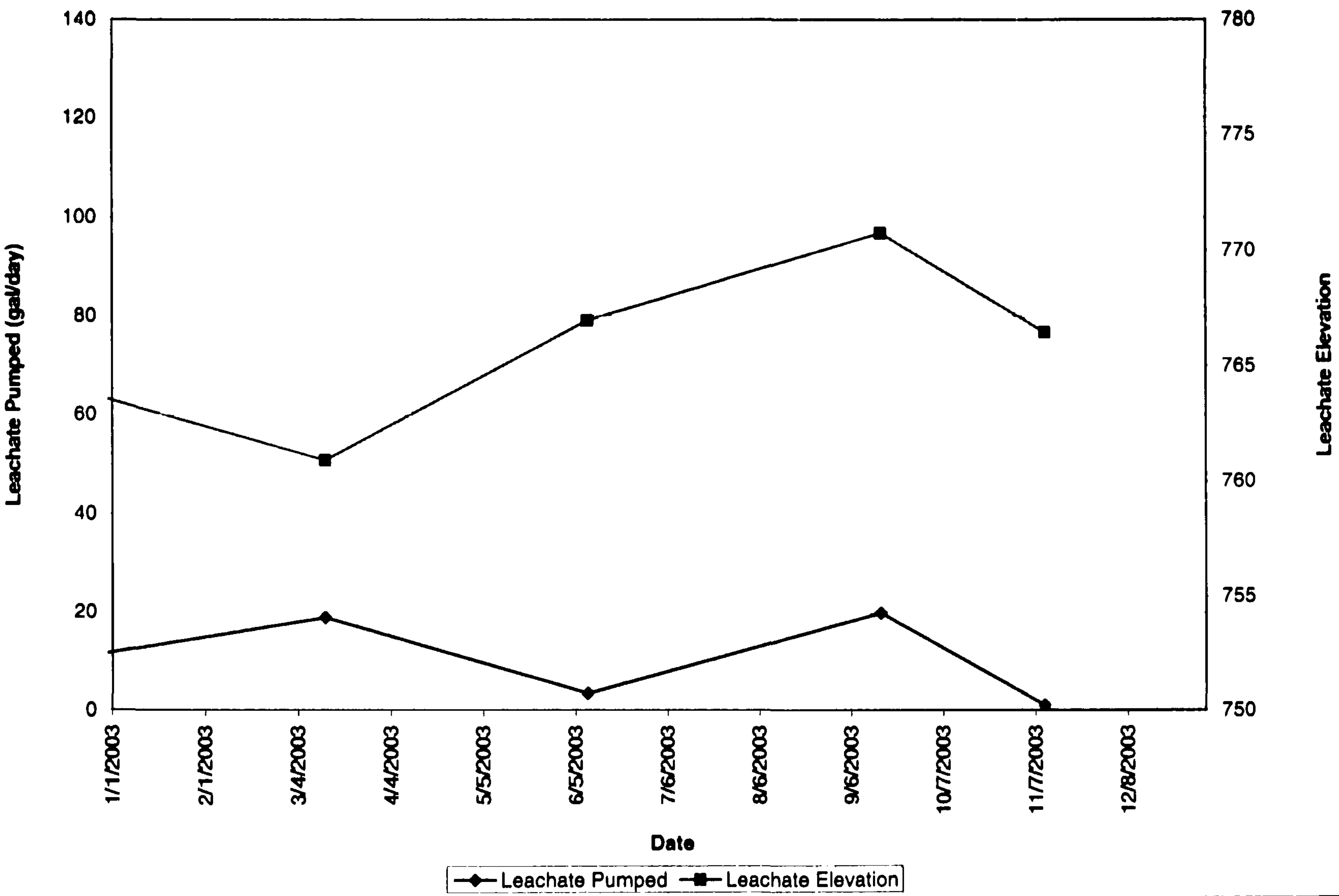
Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004



7

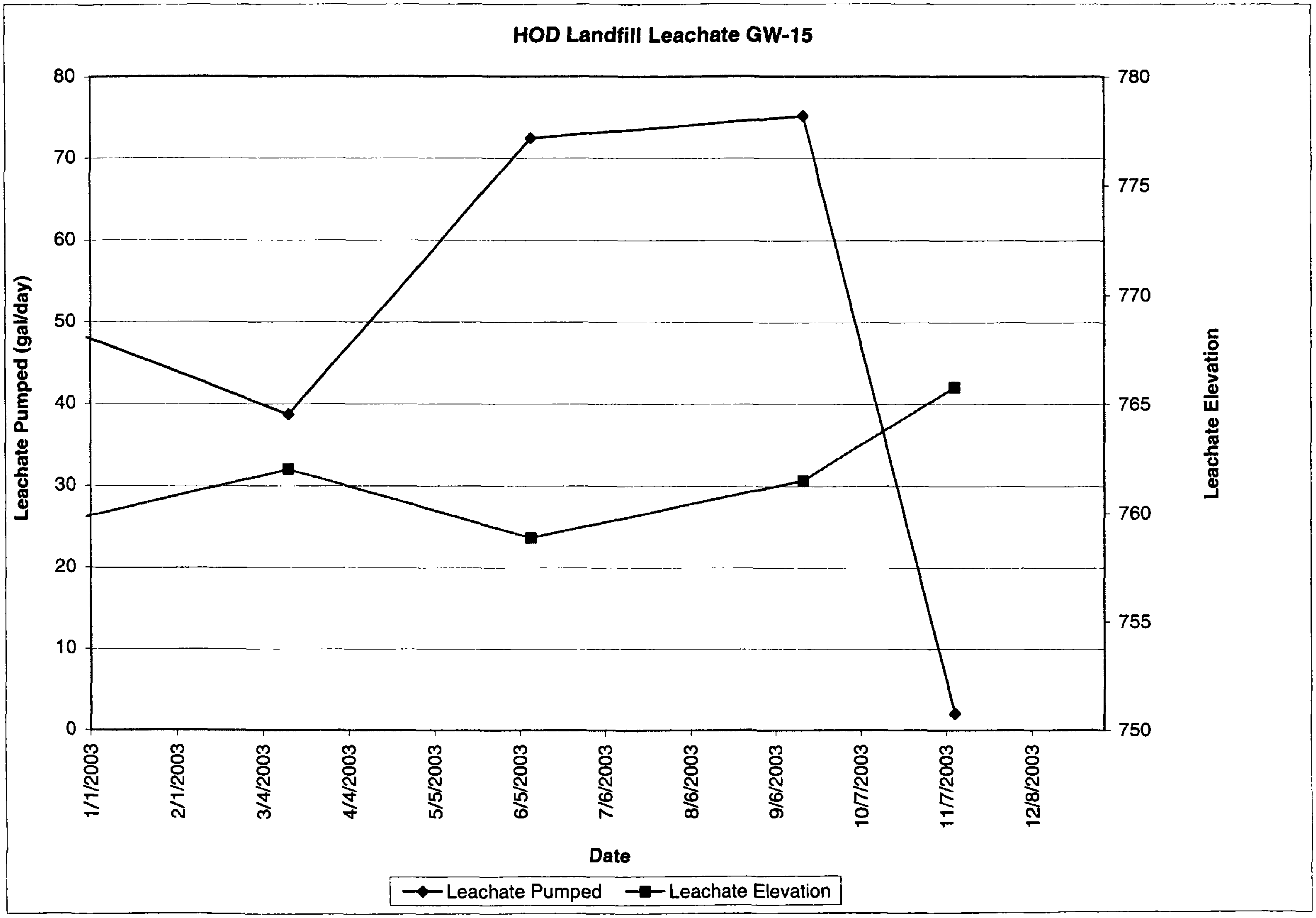
Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004

HOD Landfill Leachate GWF-10



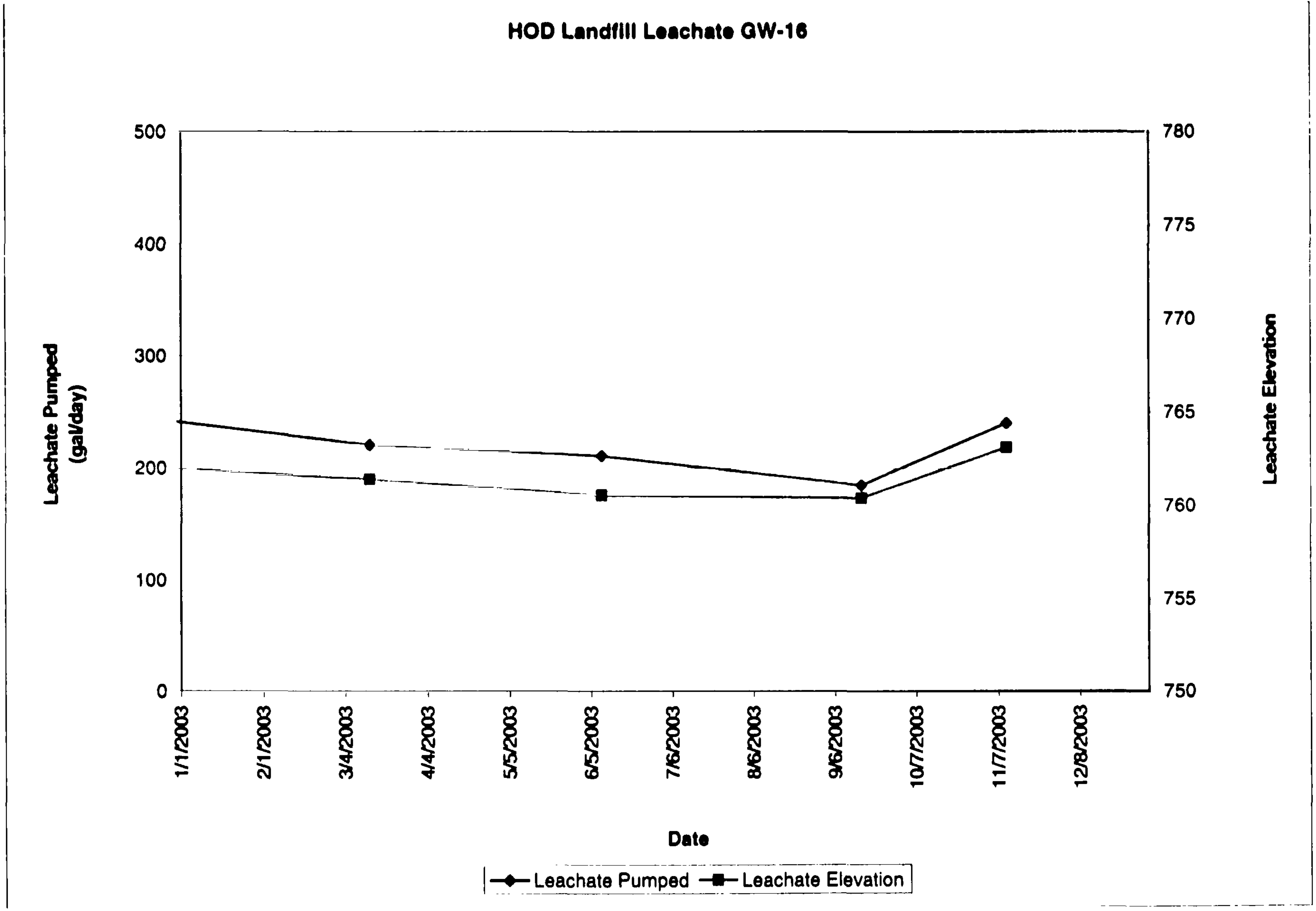
8

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004

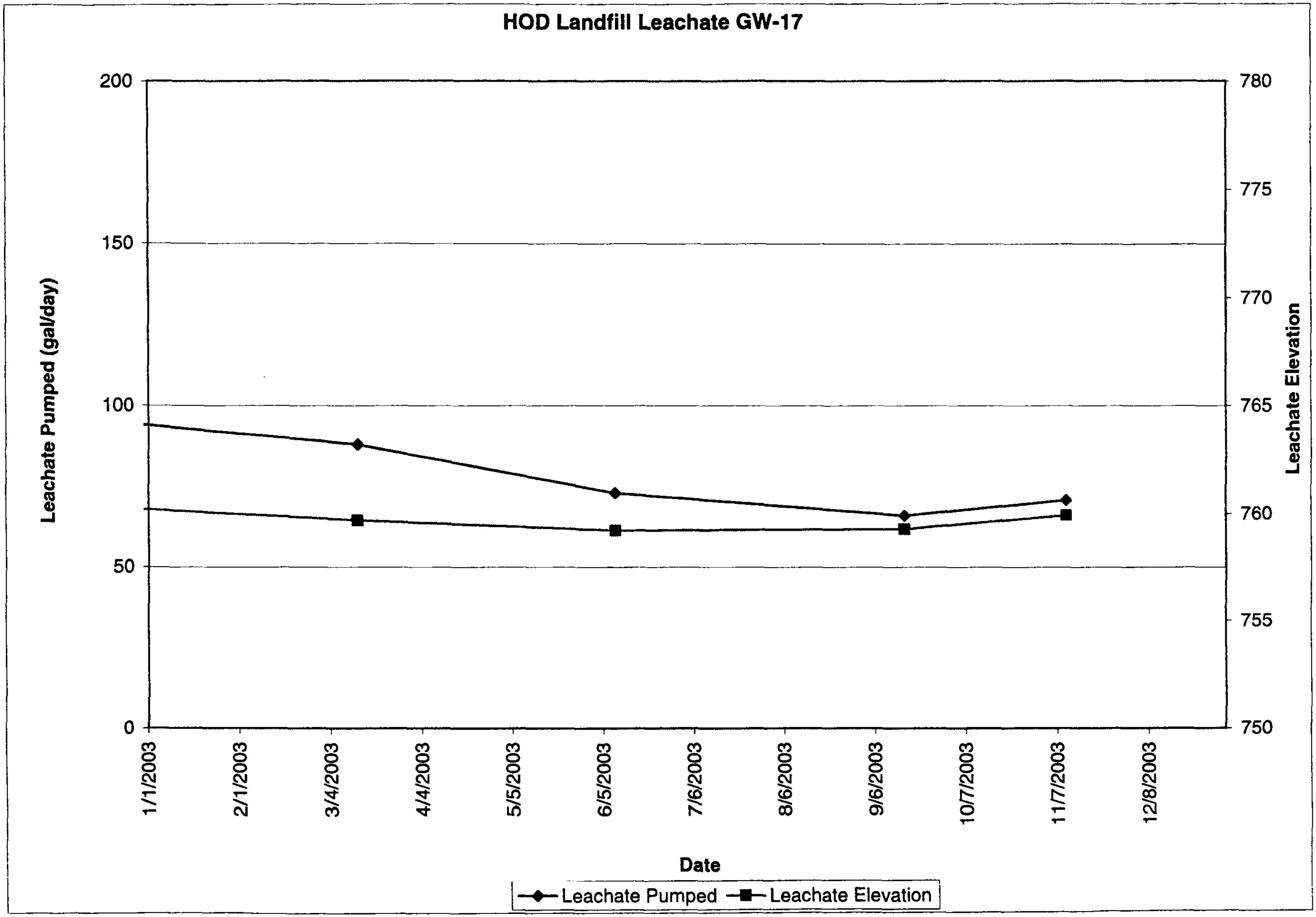


6

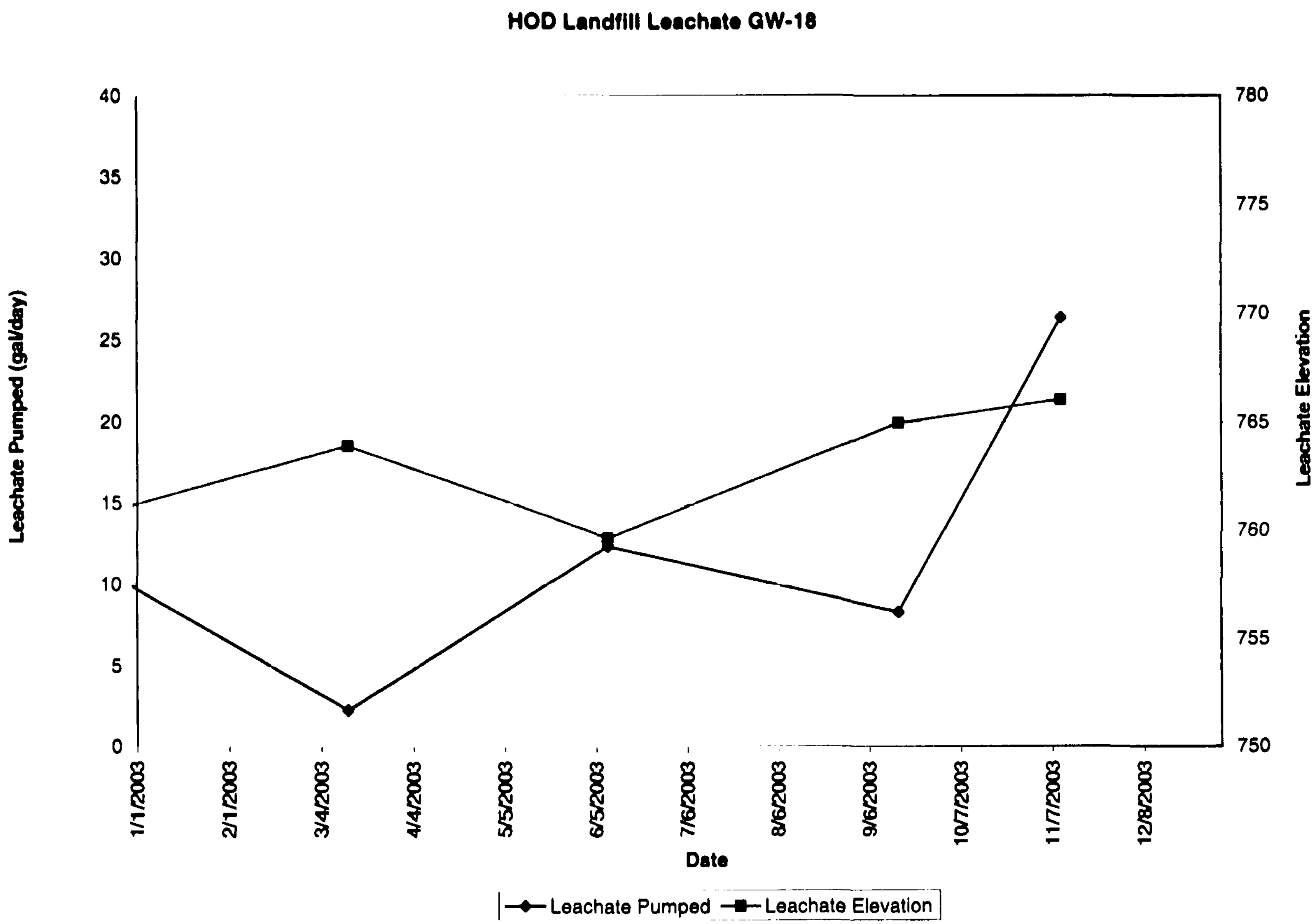
Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004



Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004

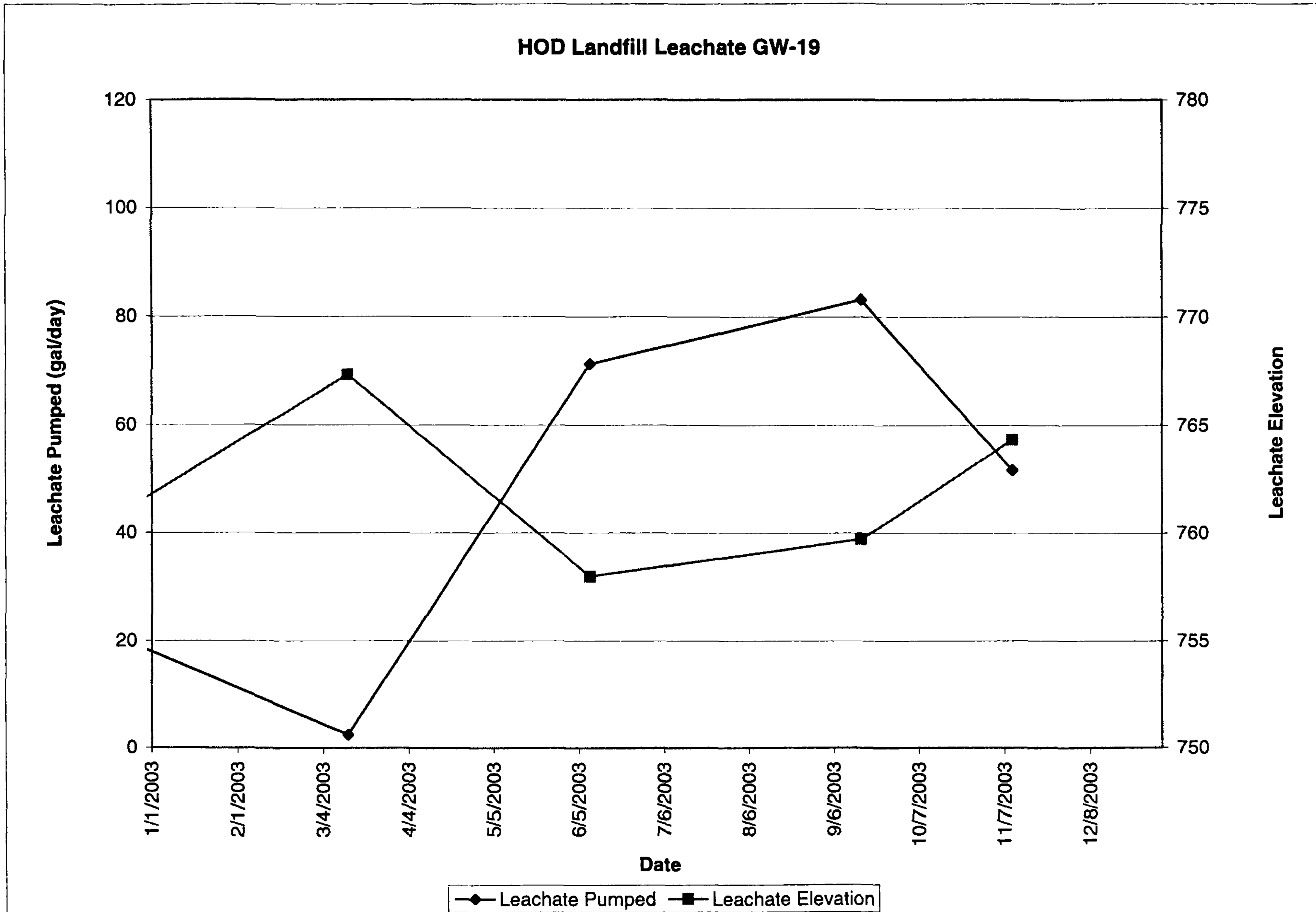


Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004



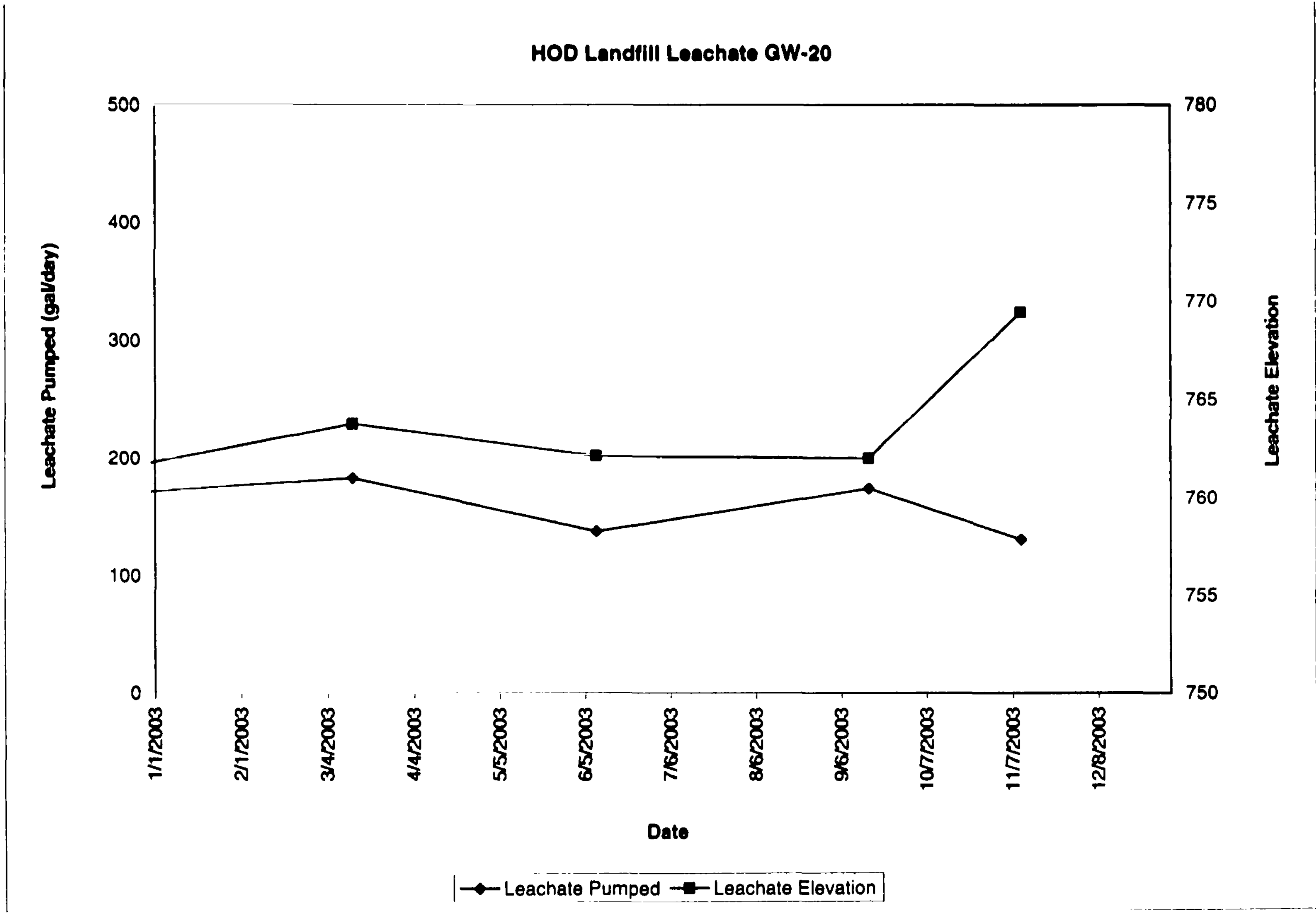
12

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023 XLS 4/23/2004



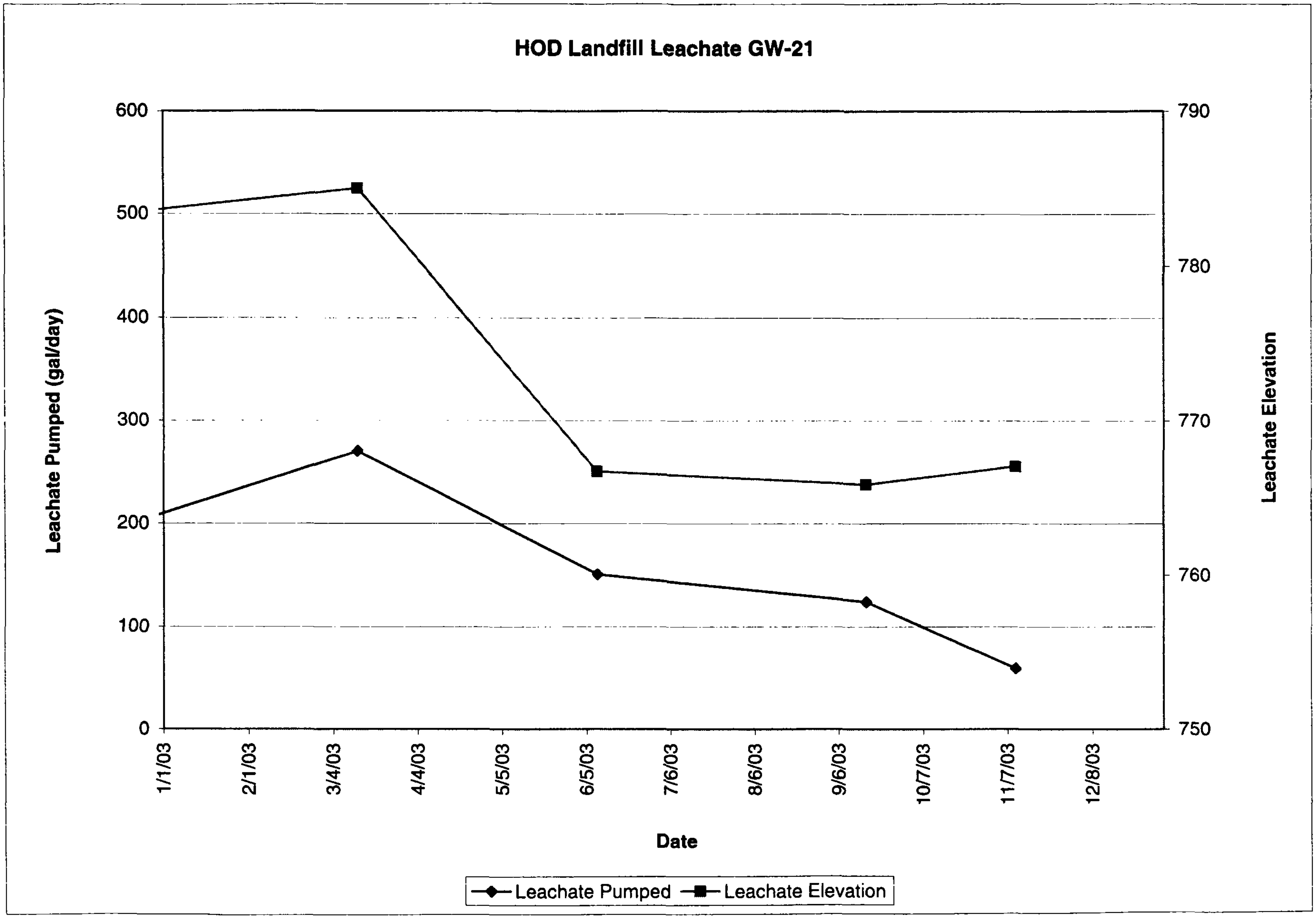
13

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004



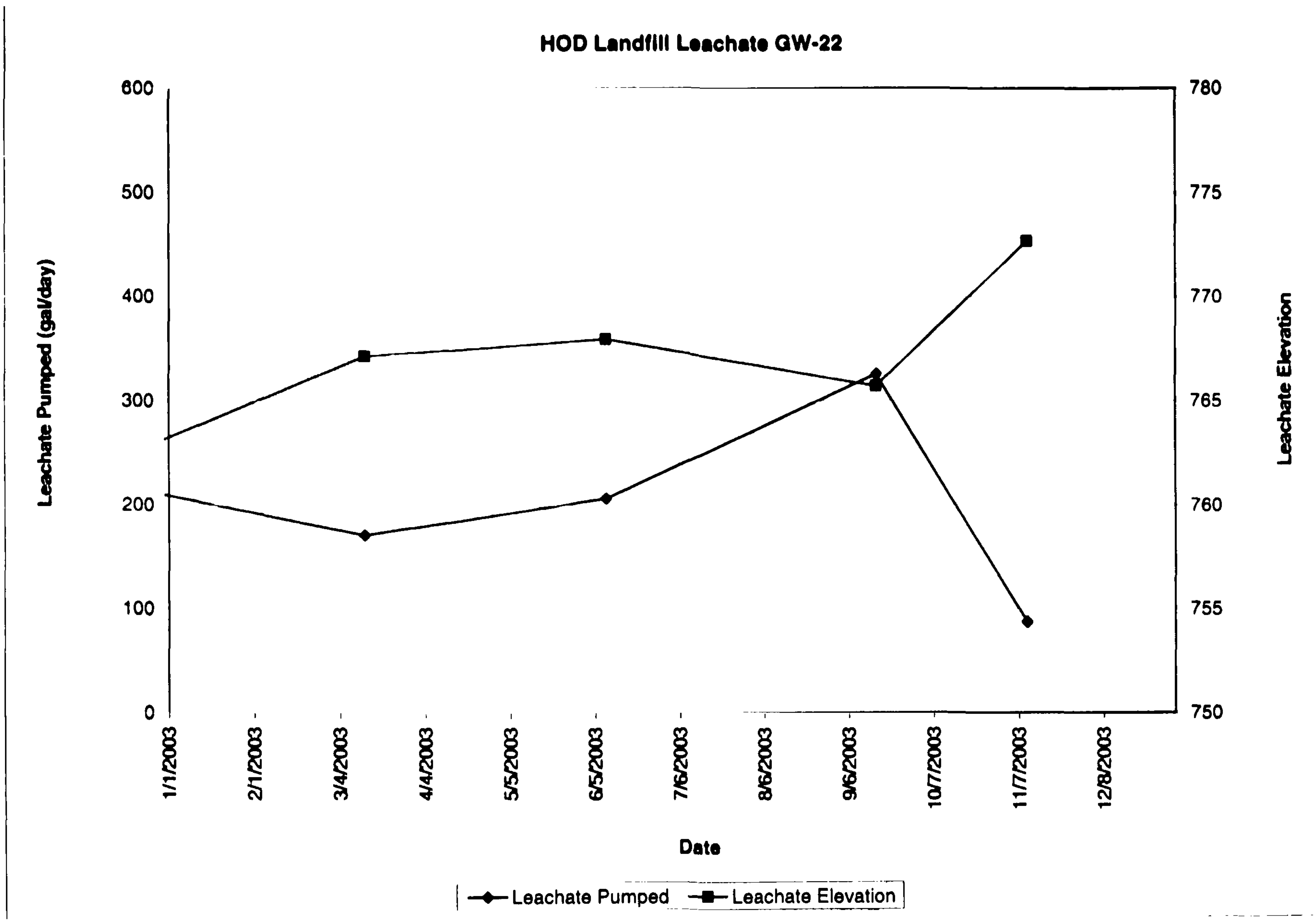
14

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSM\PJT\00-05314\41\000531441-023 XLS 4/23/2004



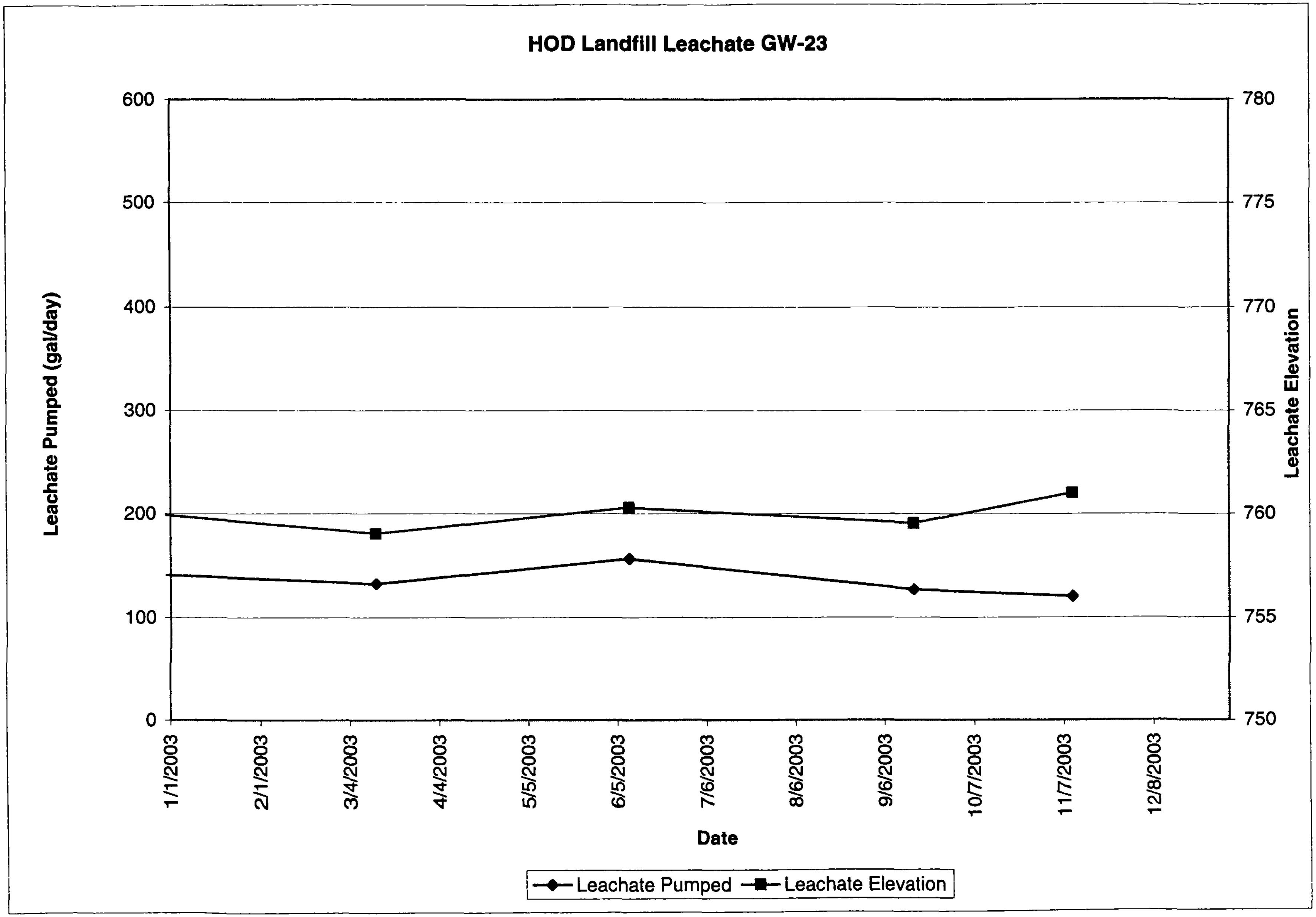
5

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/26/04



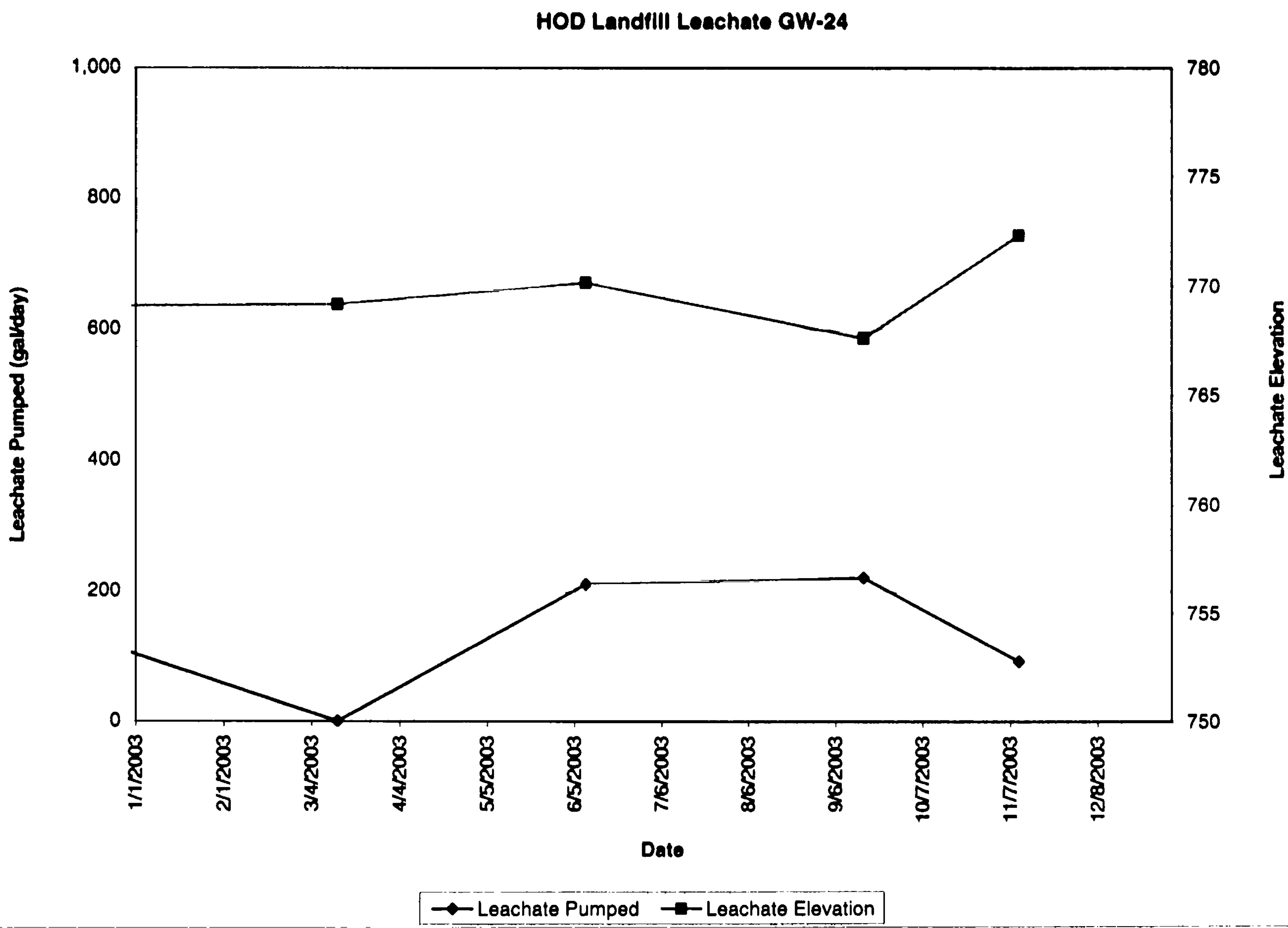
16

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004



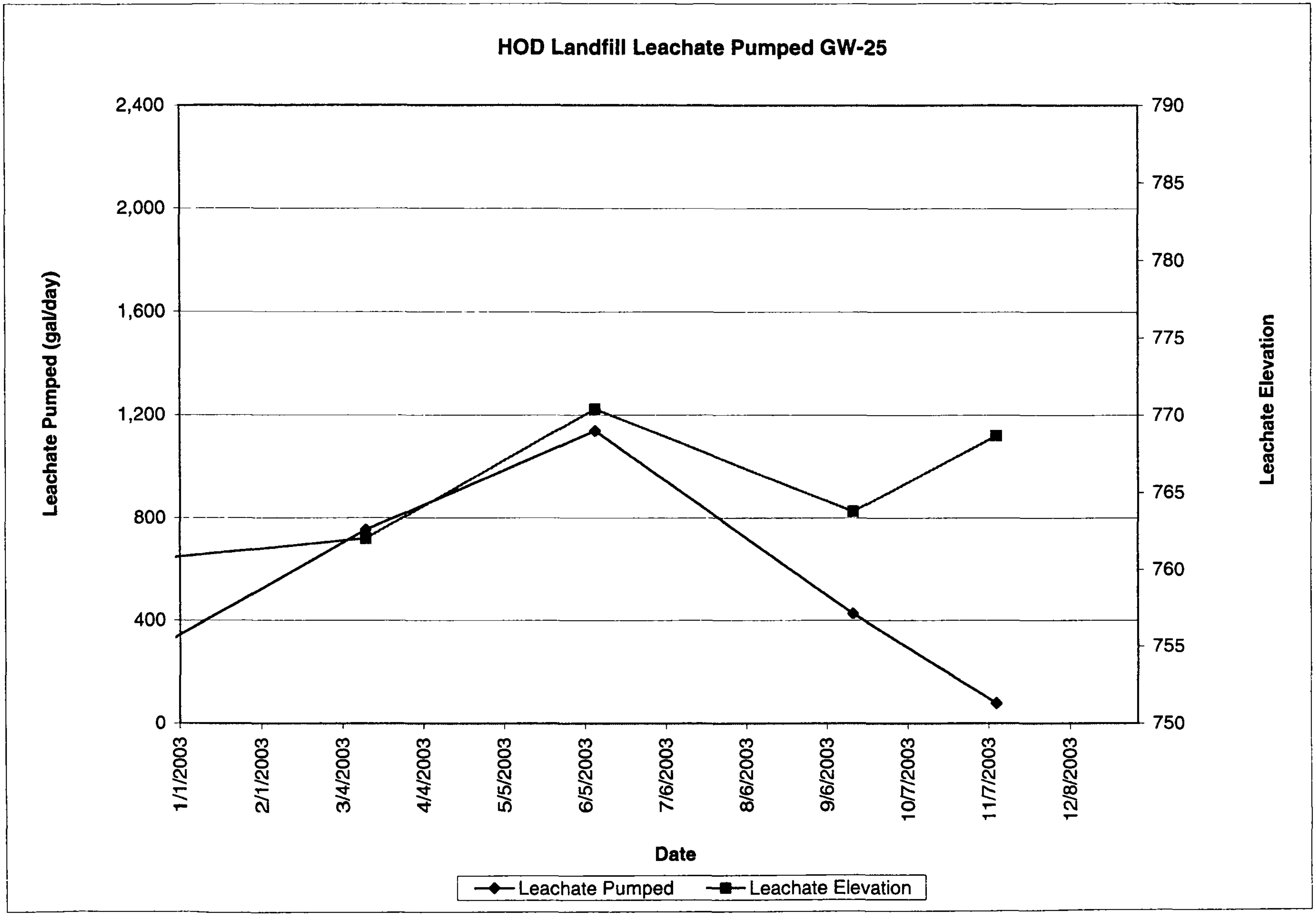
17

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and April) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004



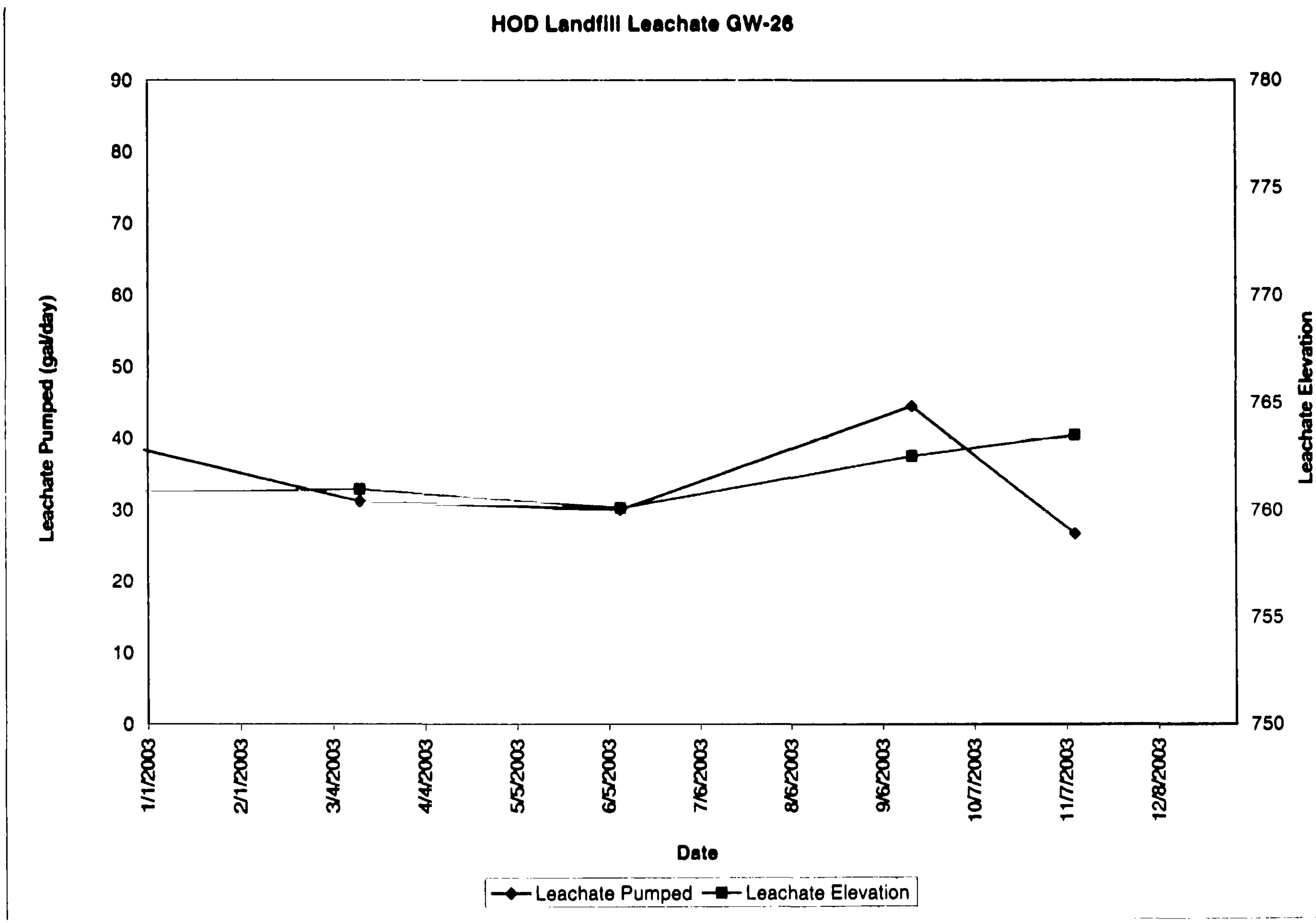
81

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004



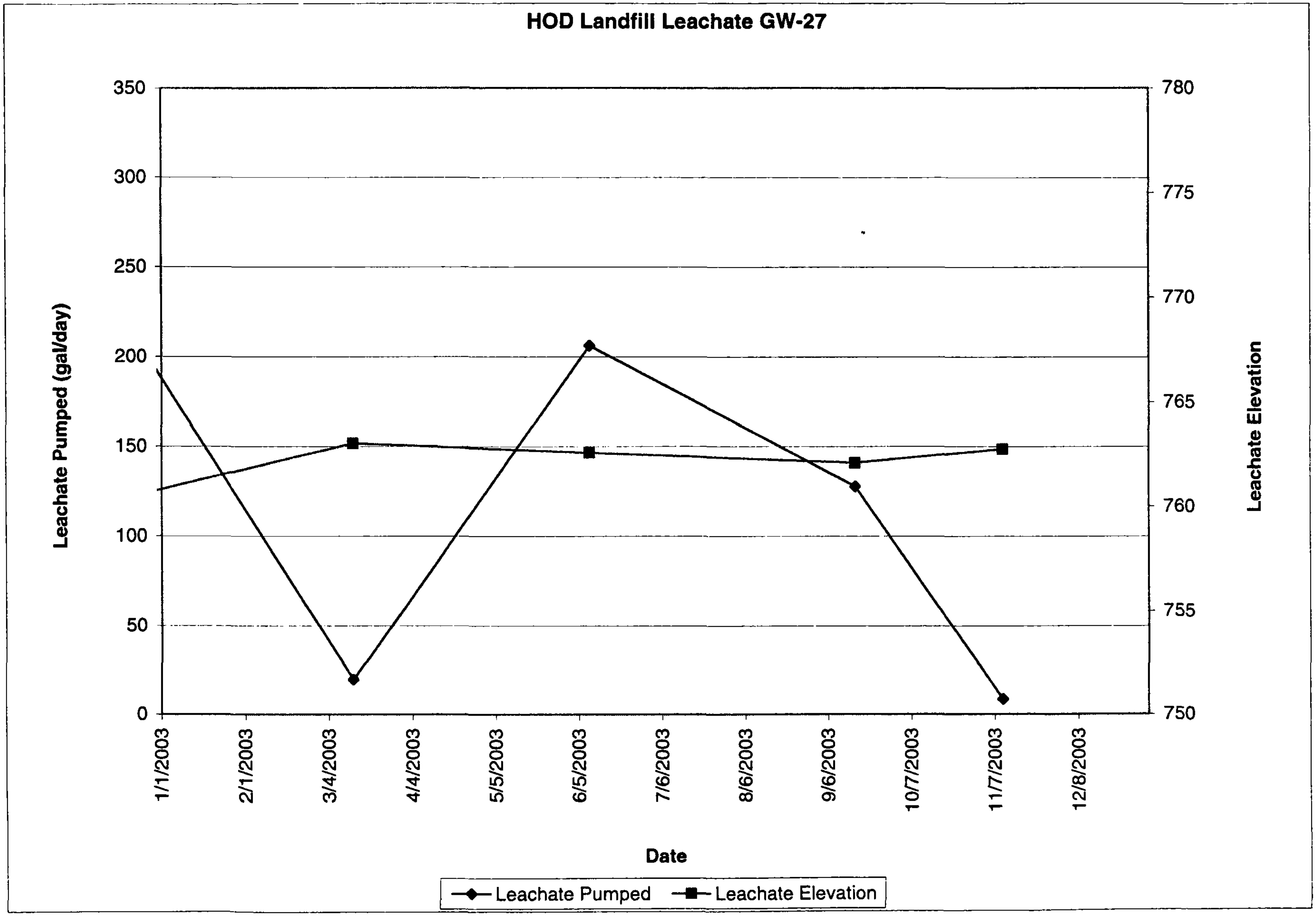
19

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-023.XLS 4/23/2004



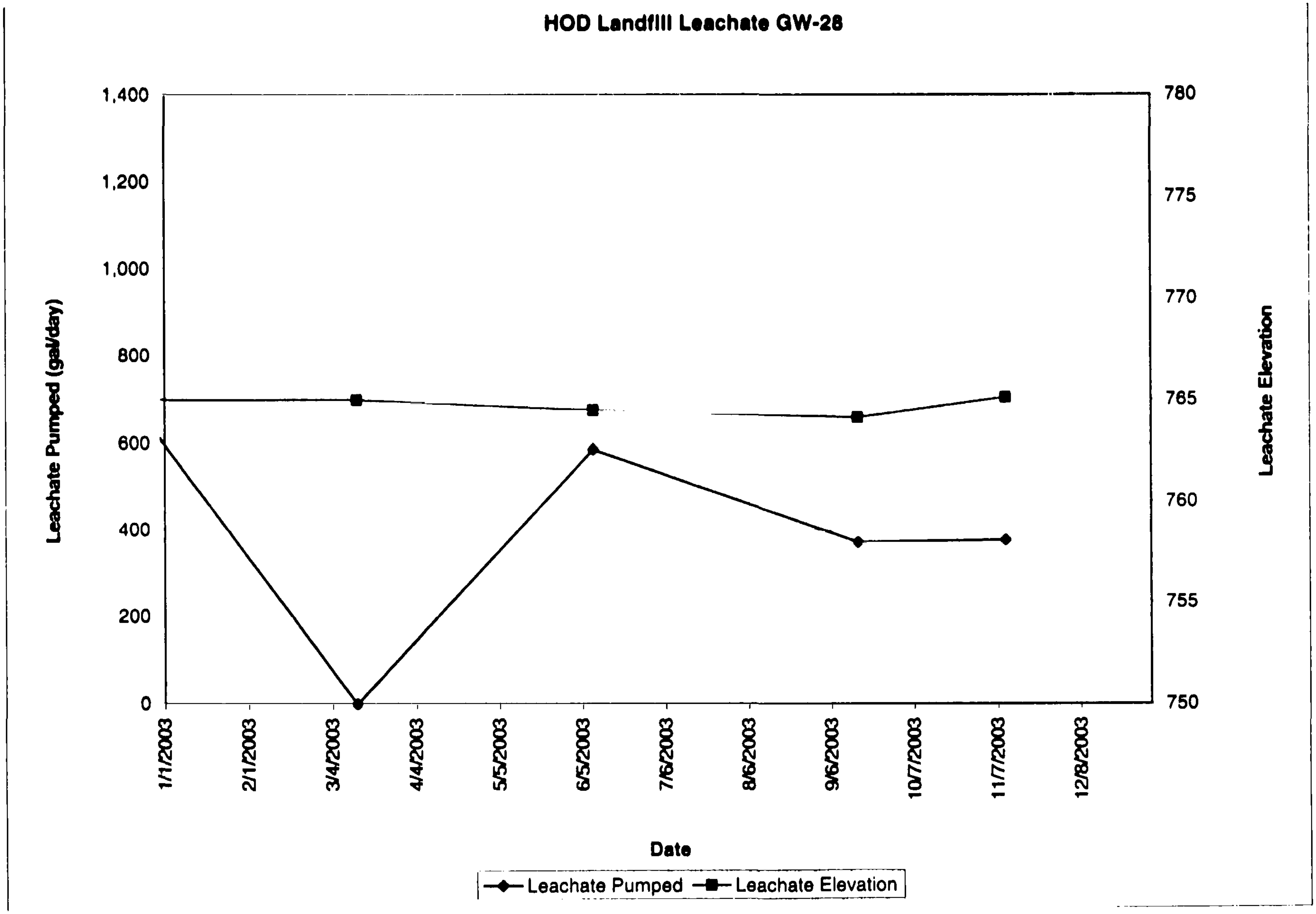
20

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



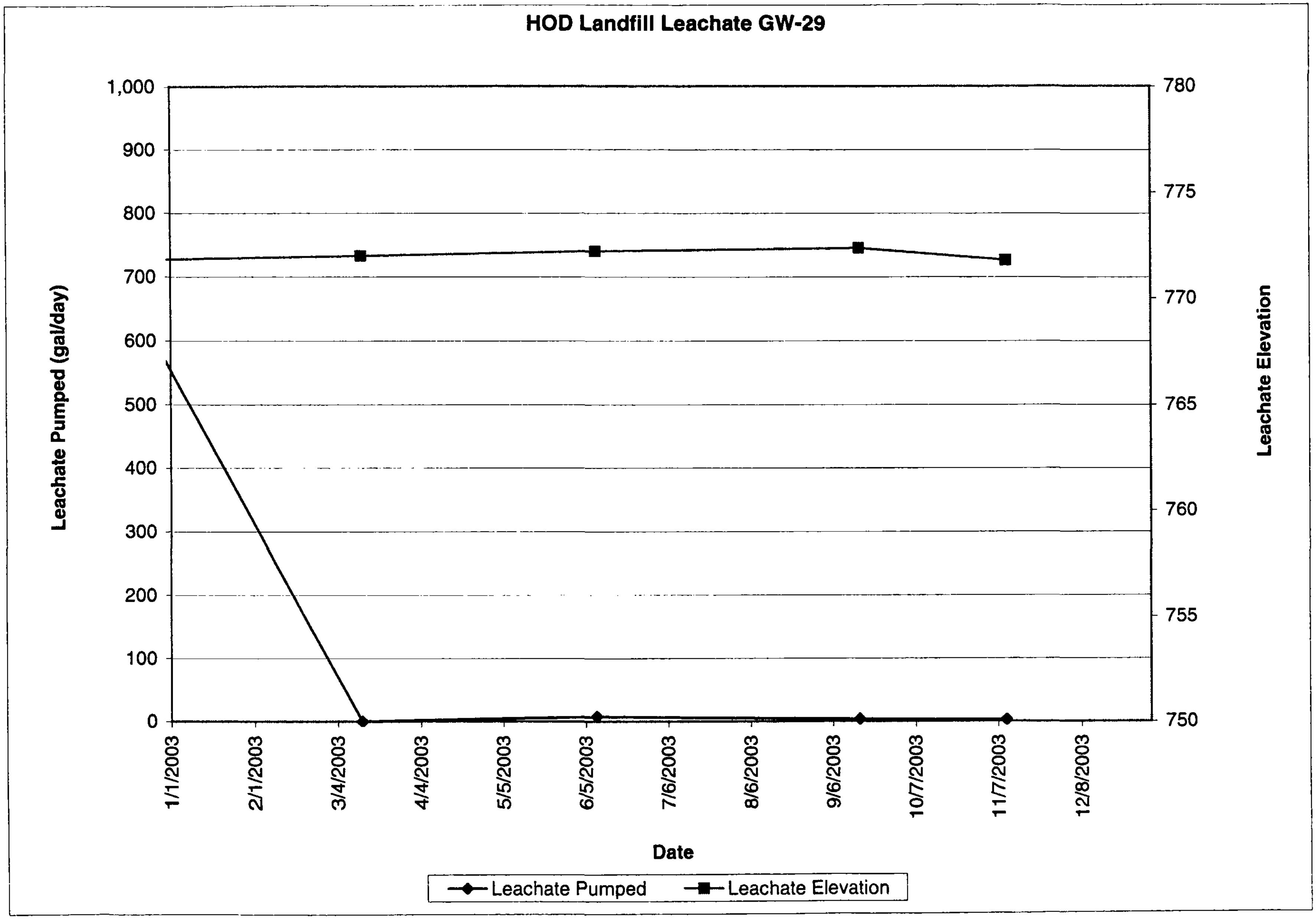
24

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



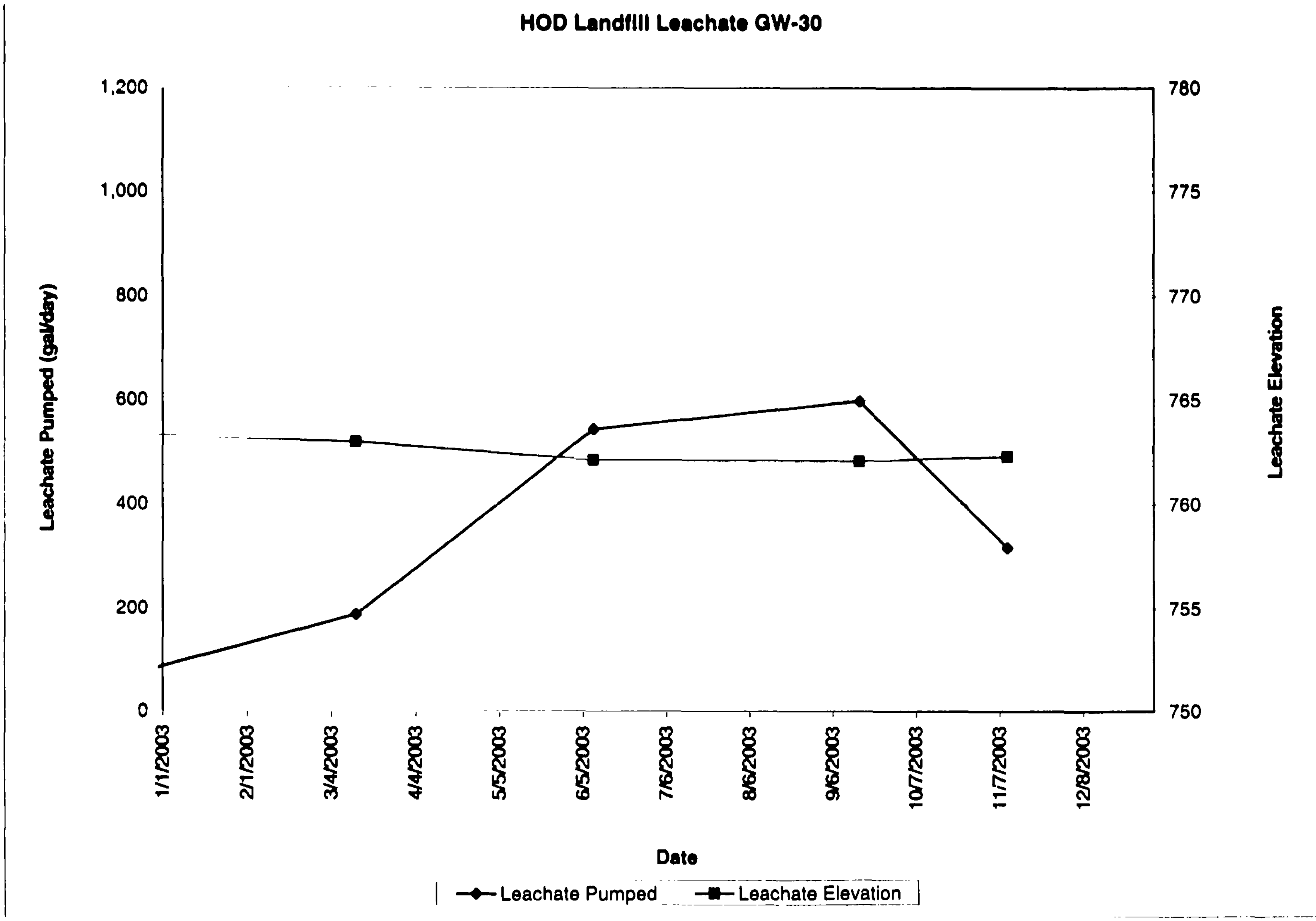
22

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (Feburary, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



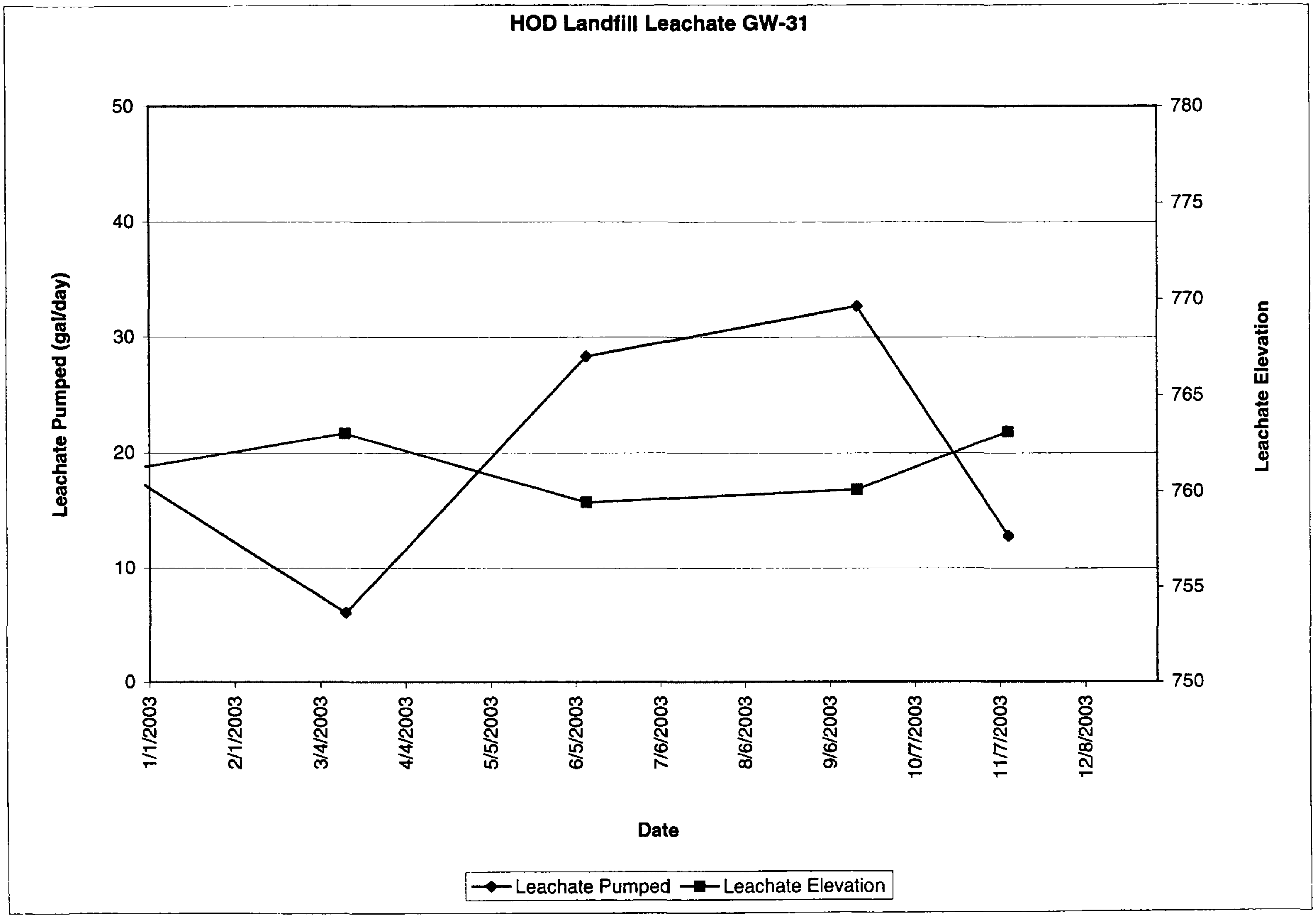
23

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



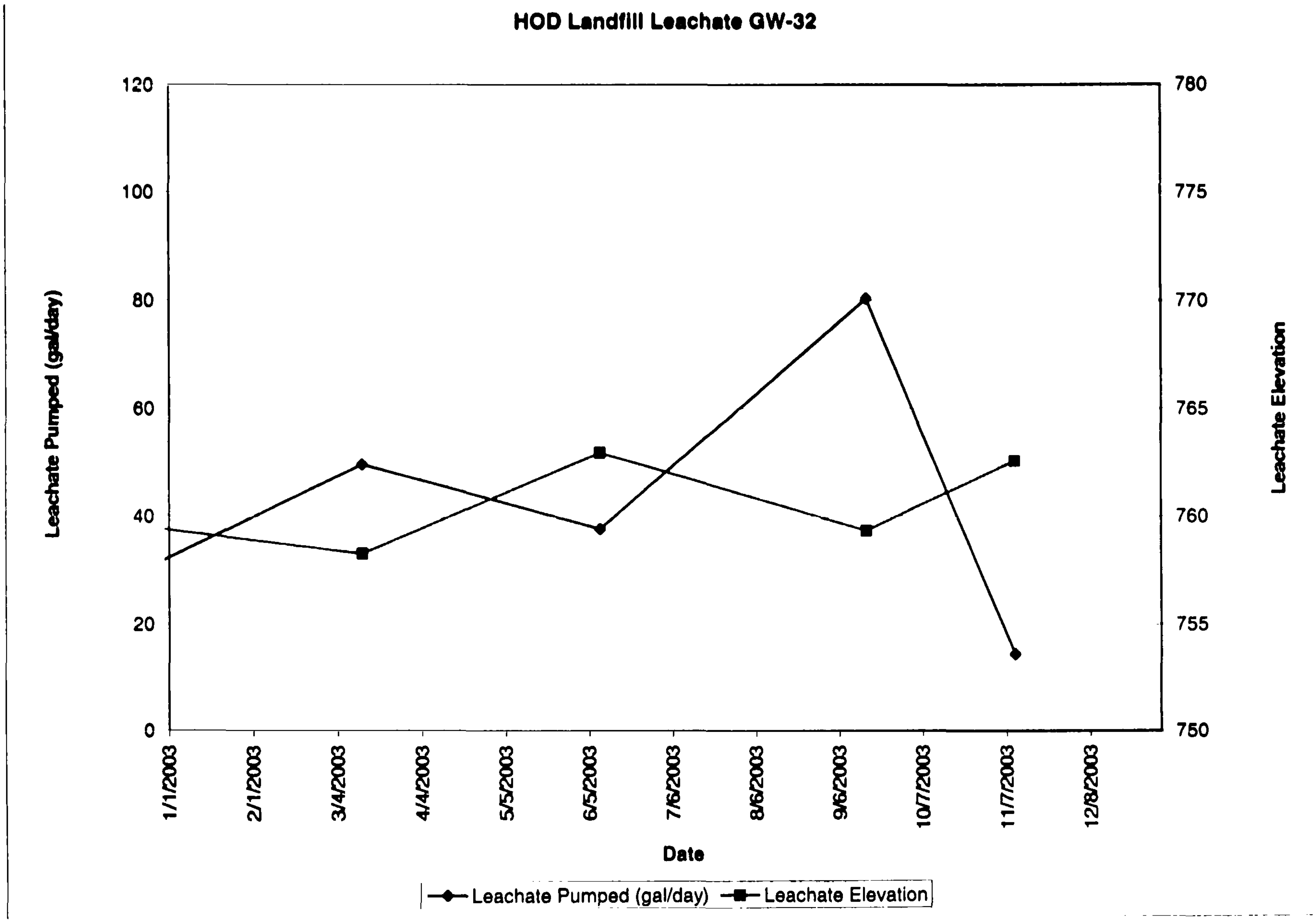
24

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



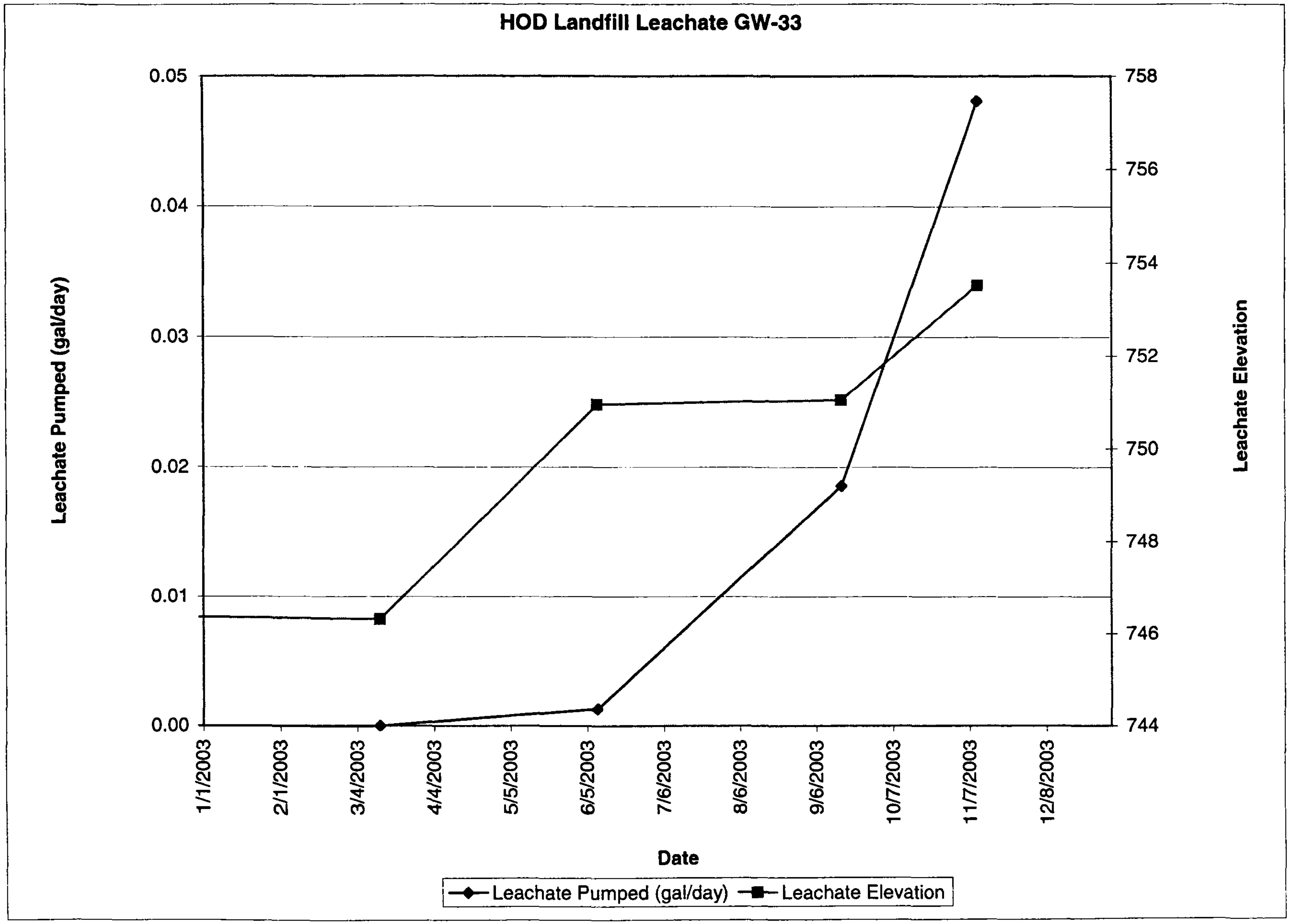
25

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



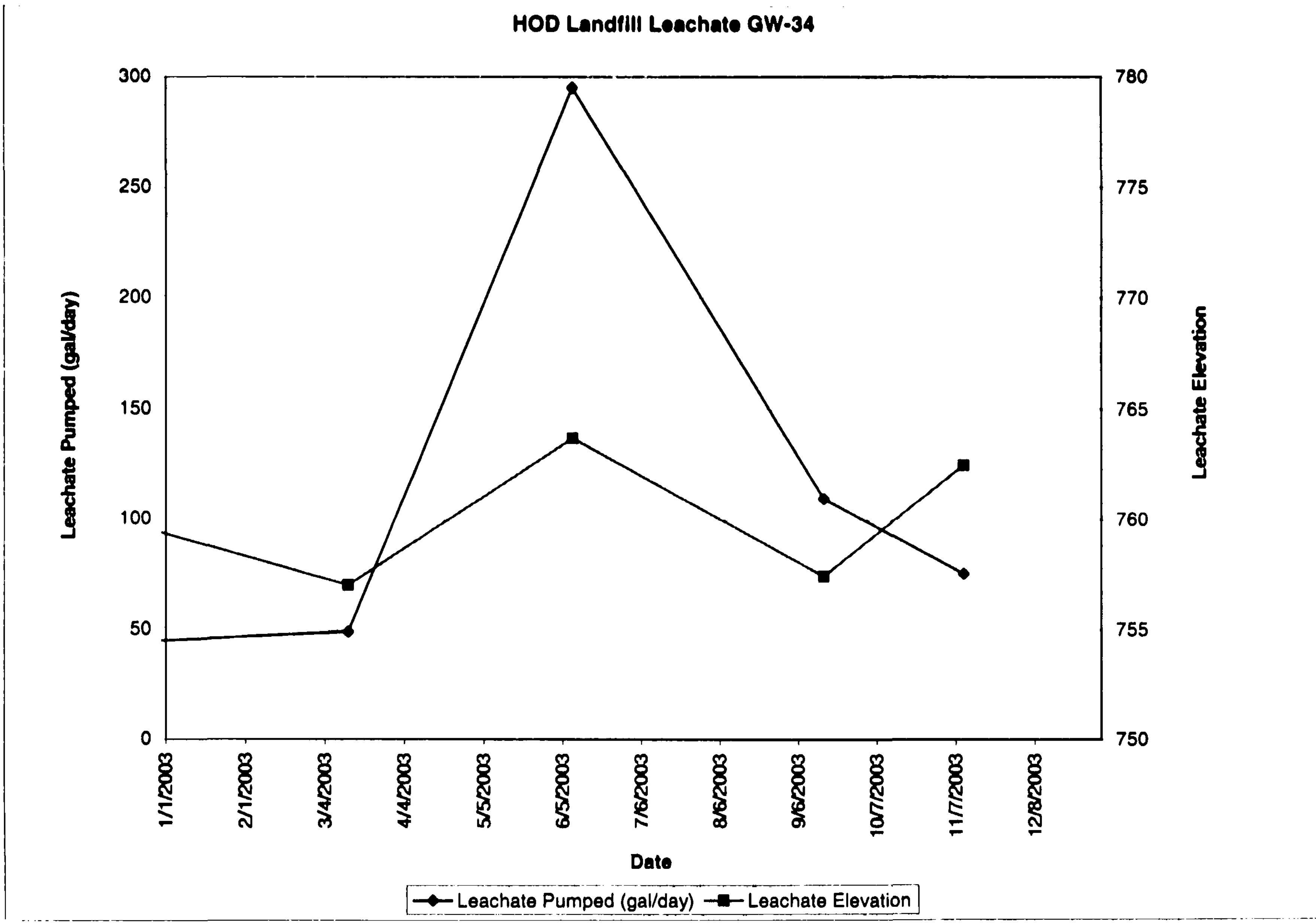
26

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



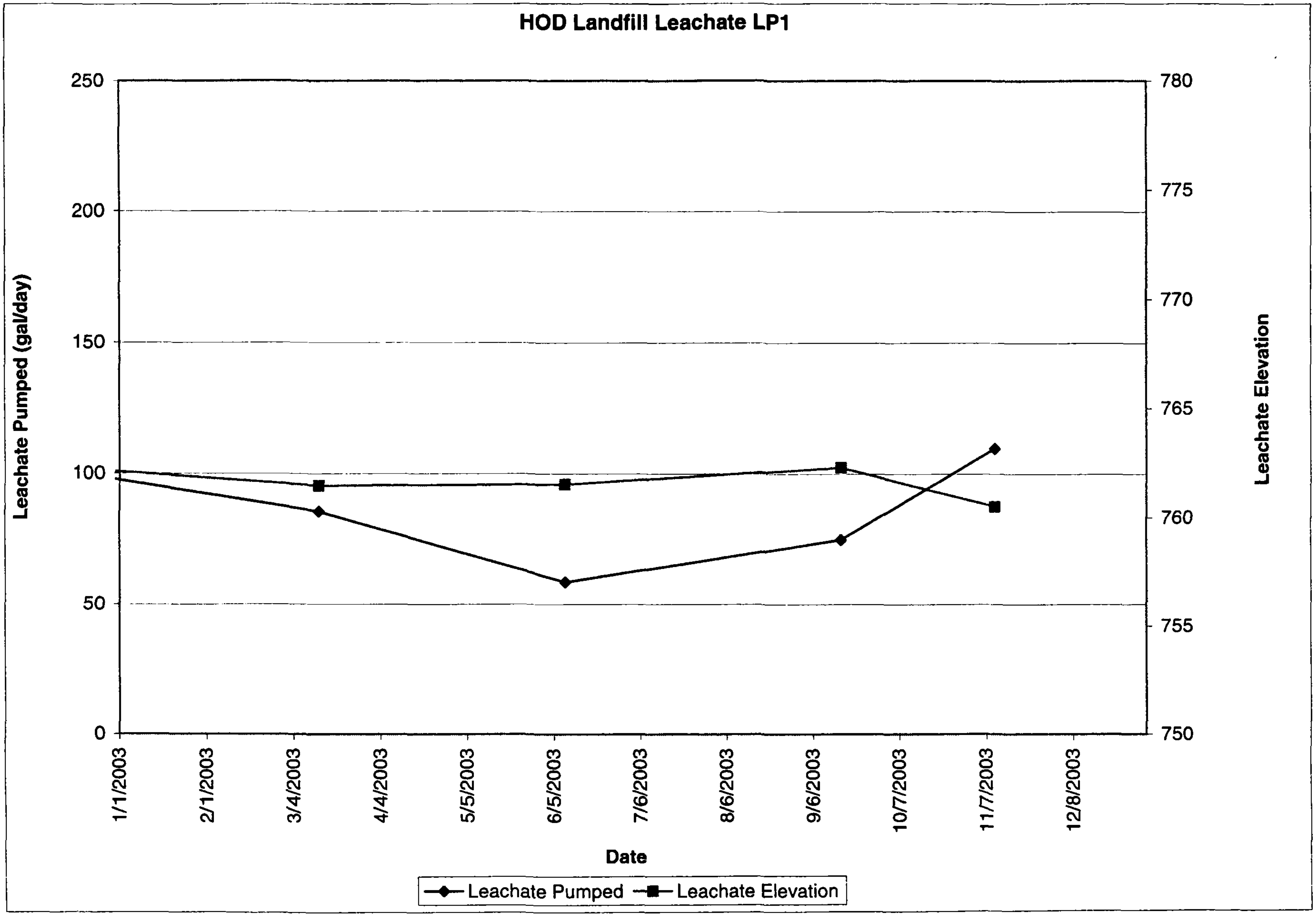
27

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



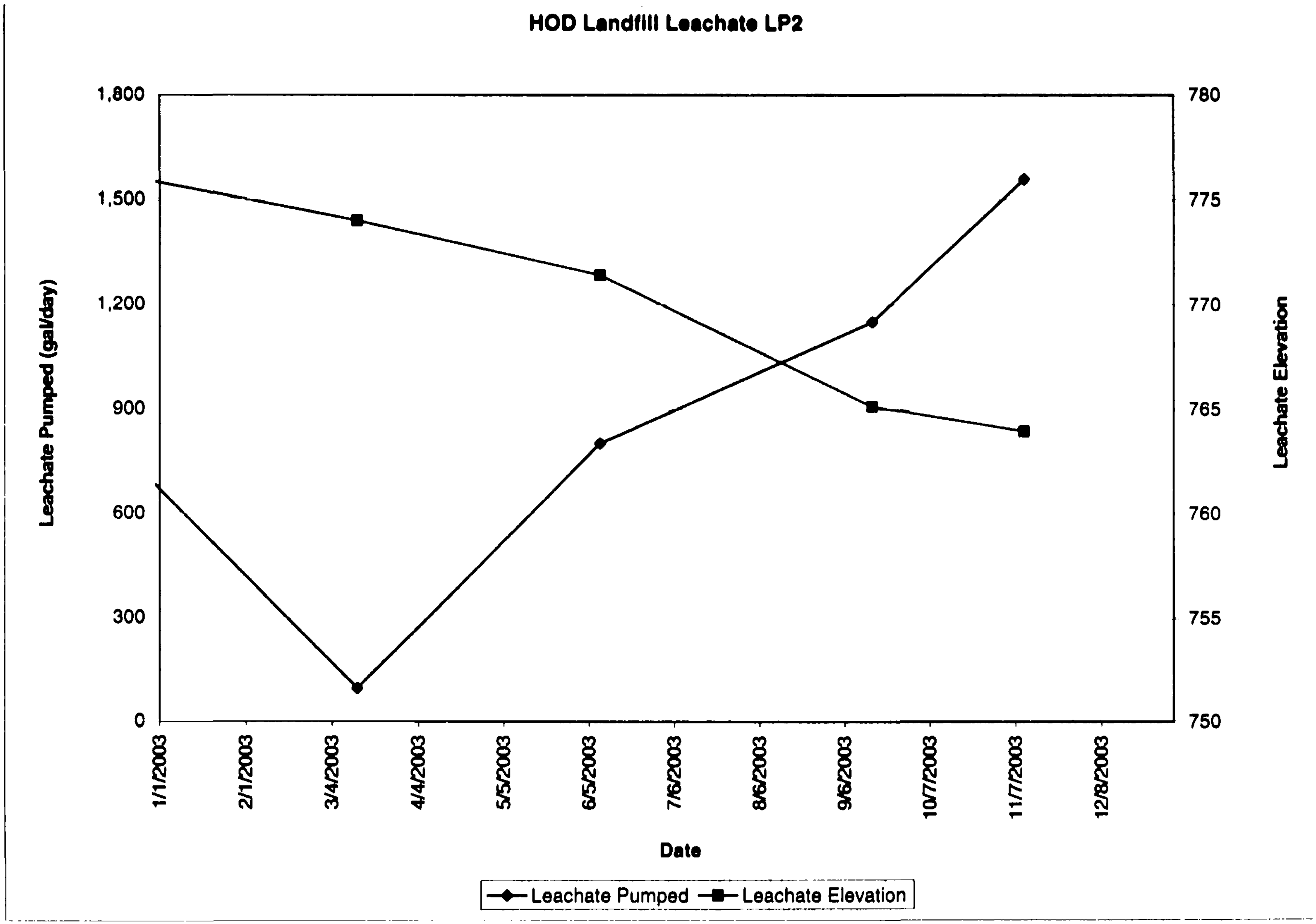
28

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



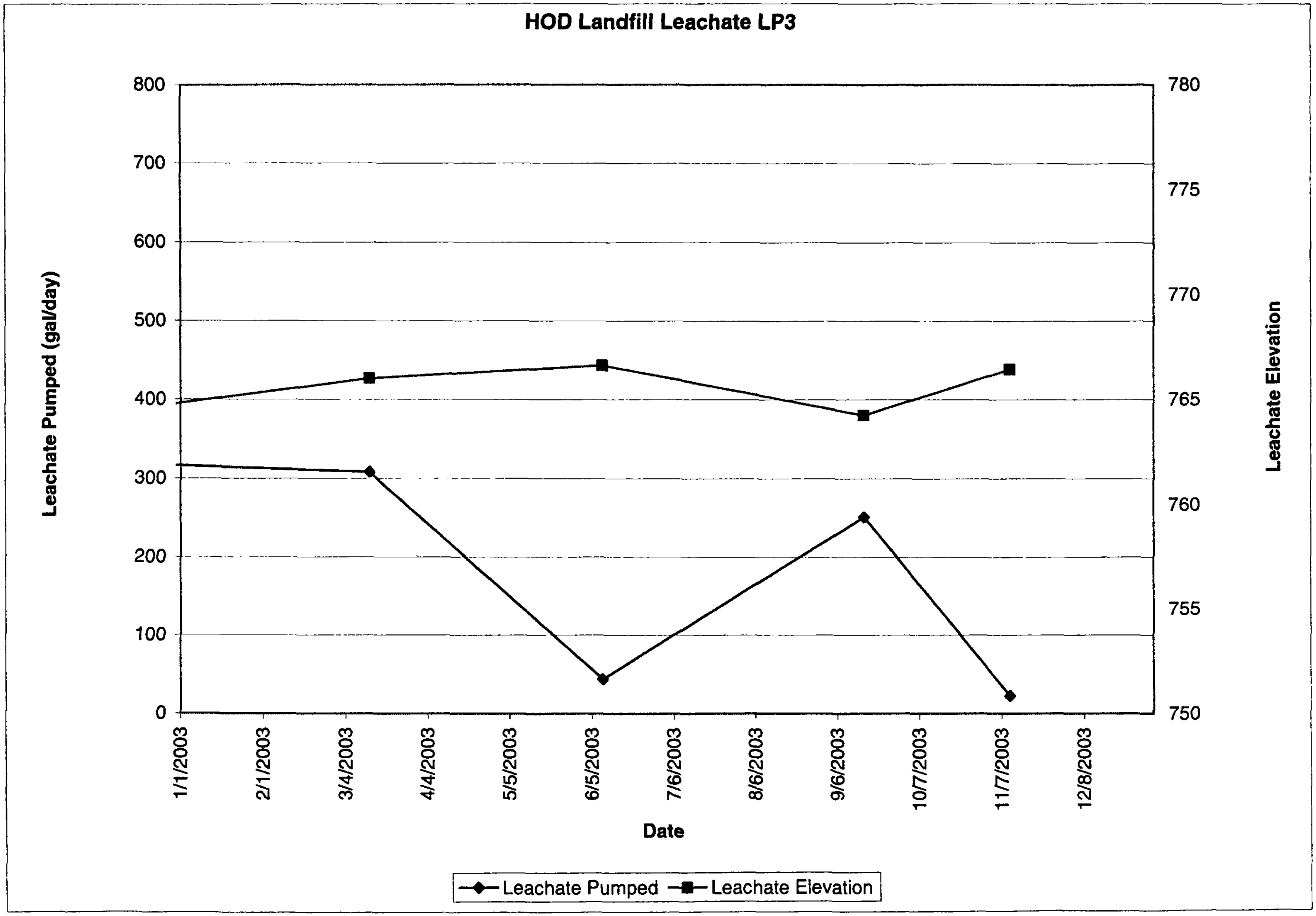
29

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



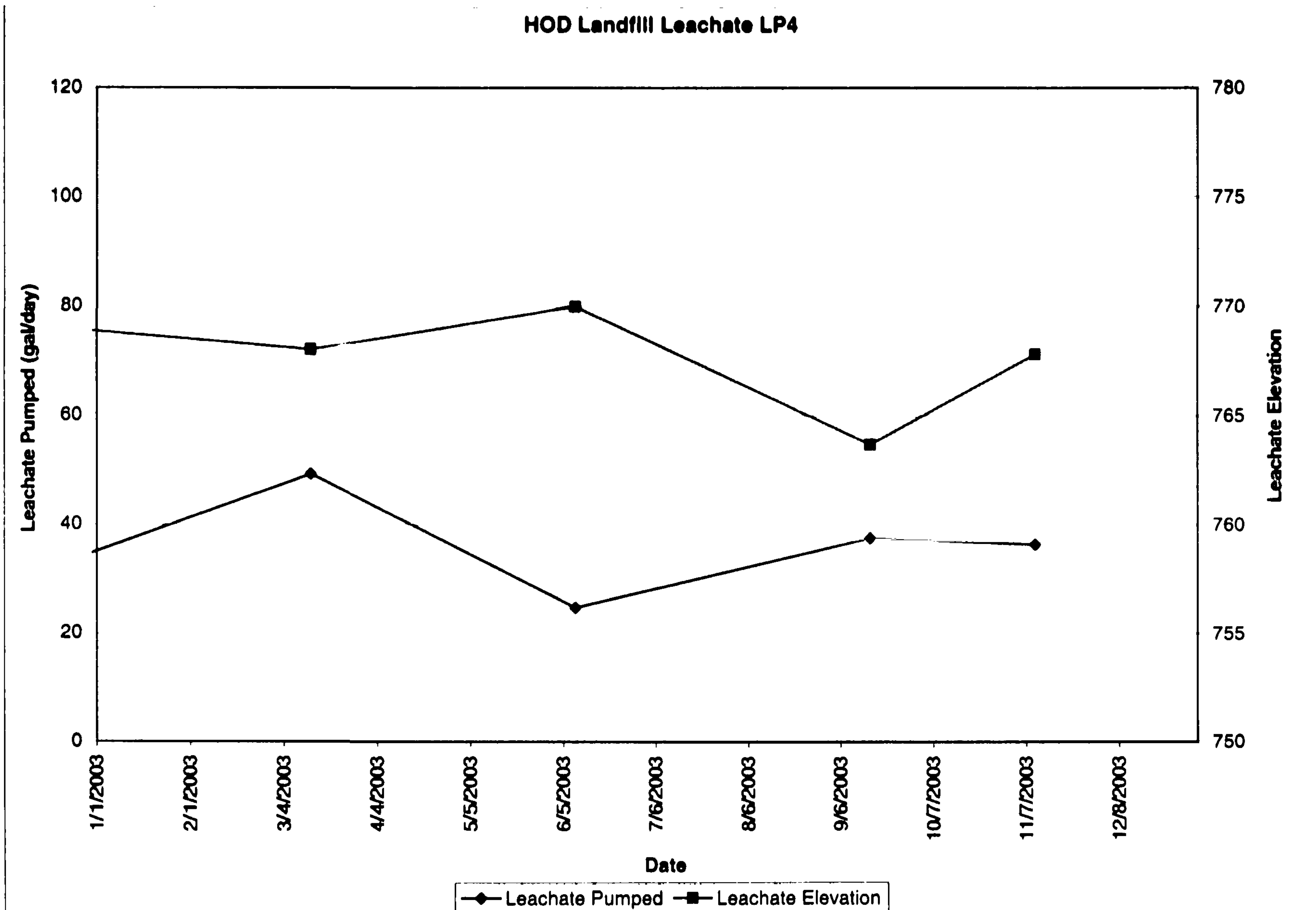
30

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



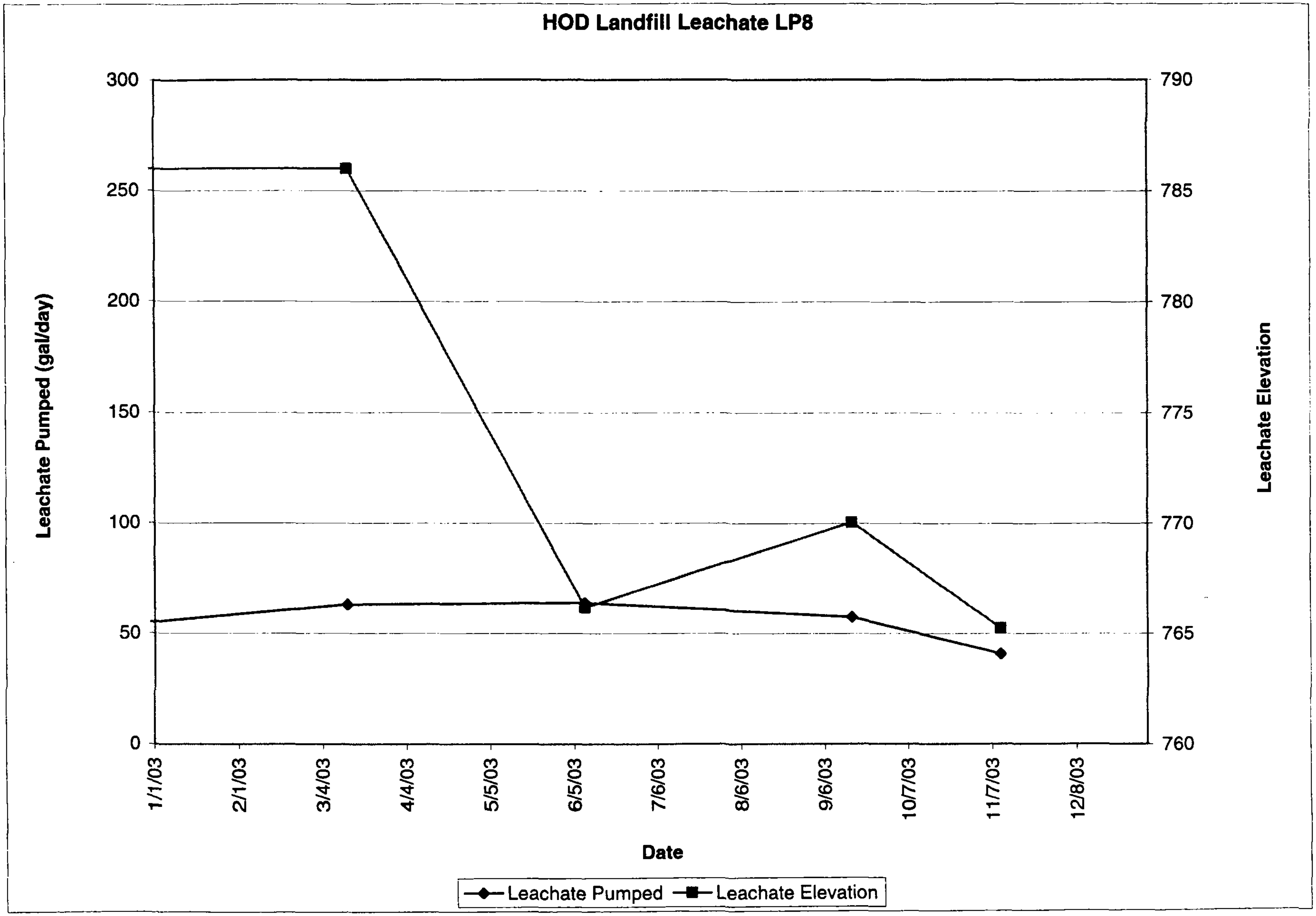
31

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



32

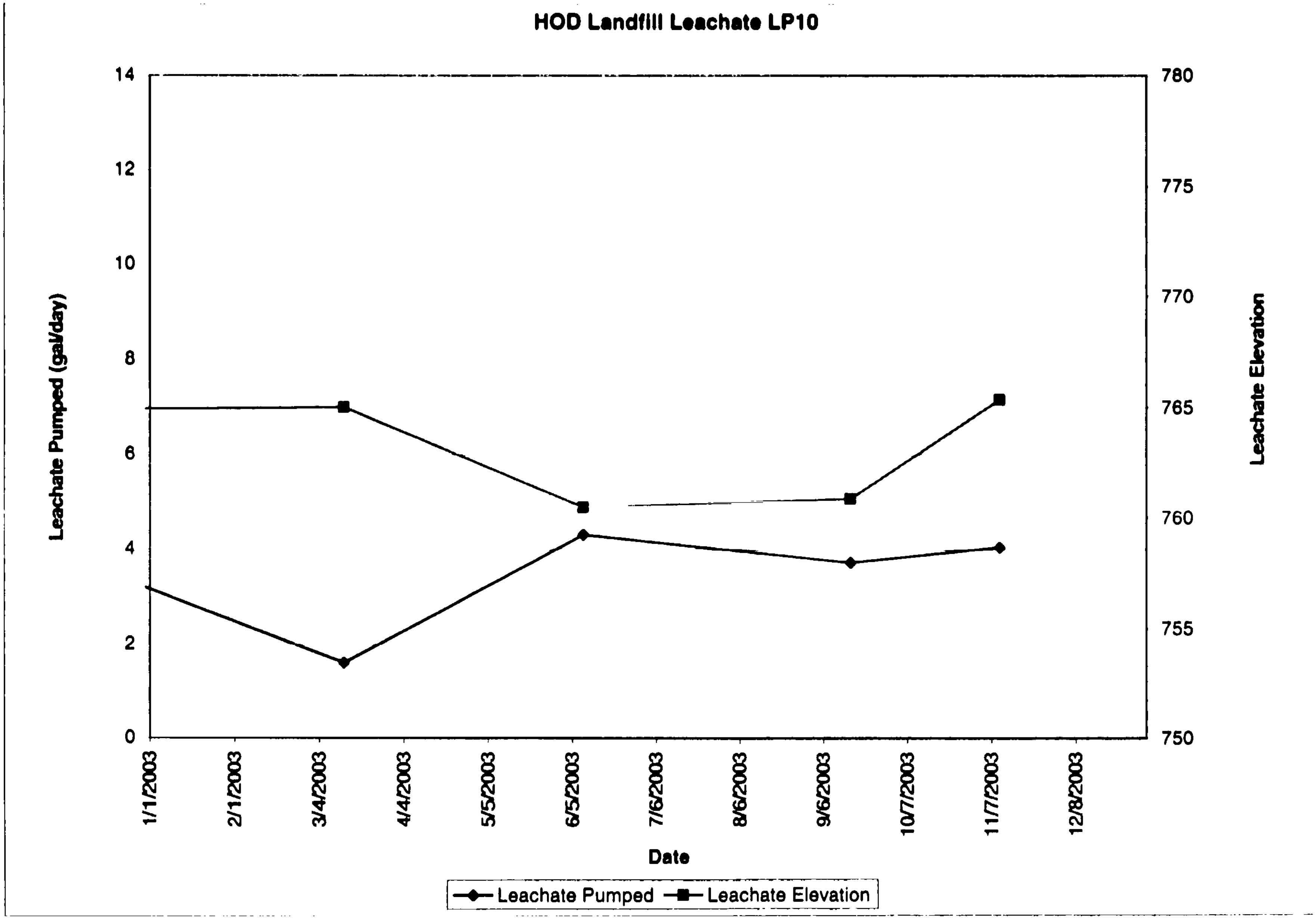
Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024 XLS 4/23/2004



33

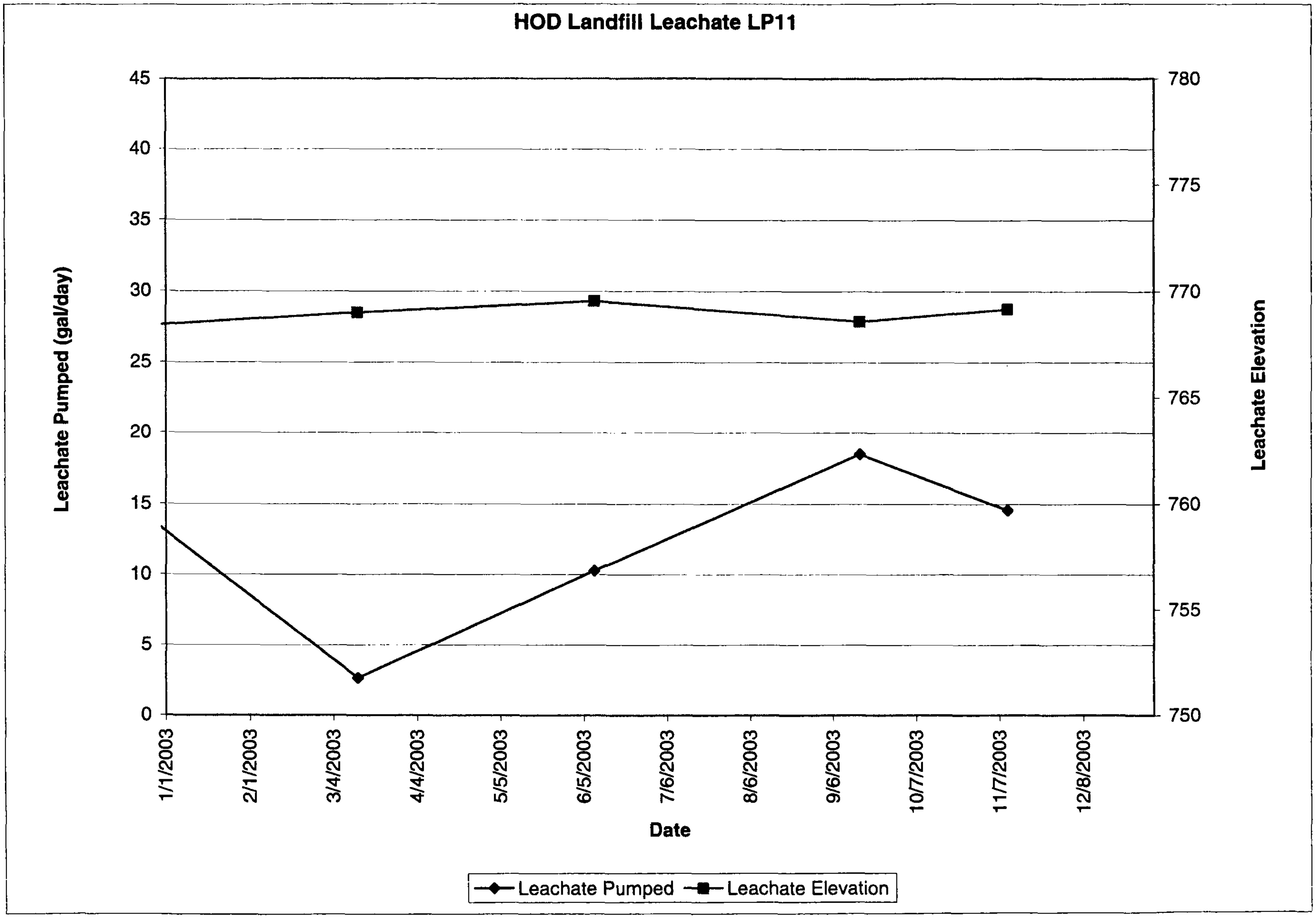
Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, August) and for 7 days in November.

I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/26/04



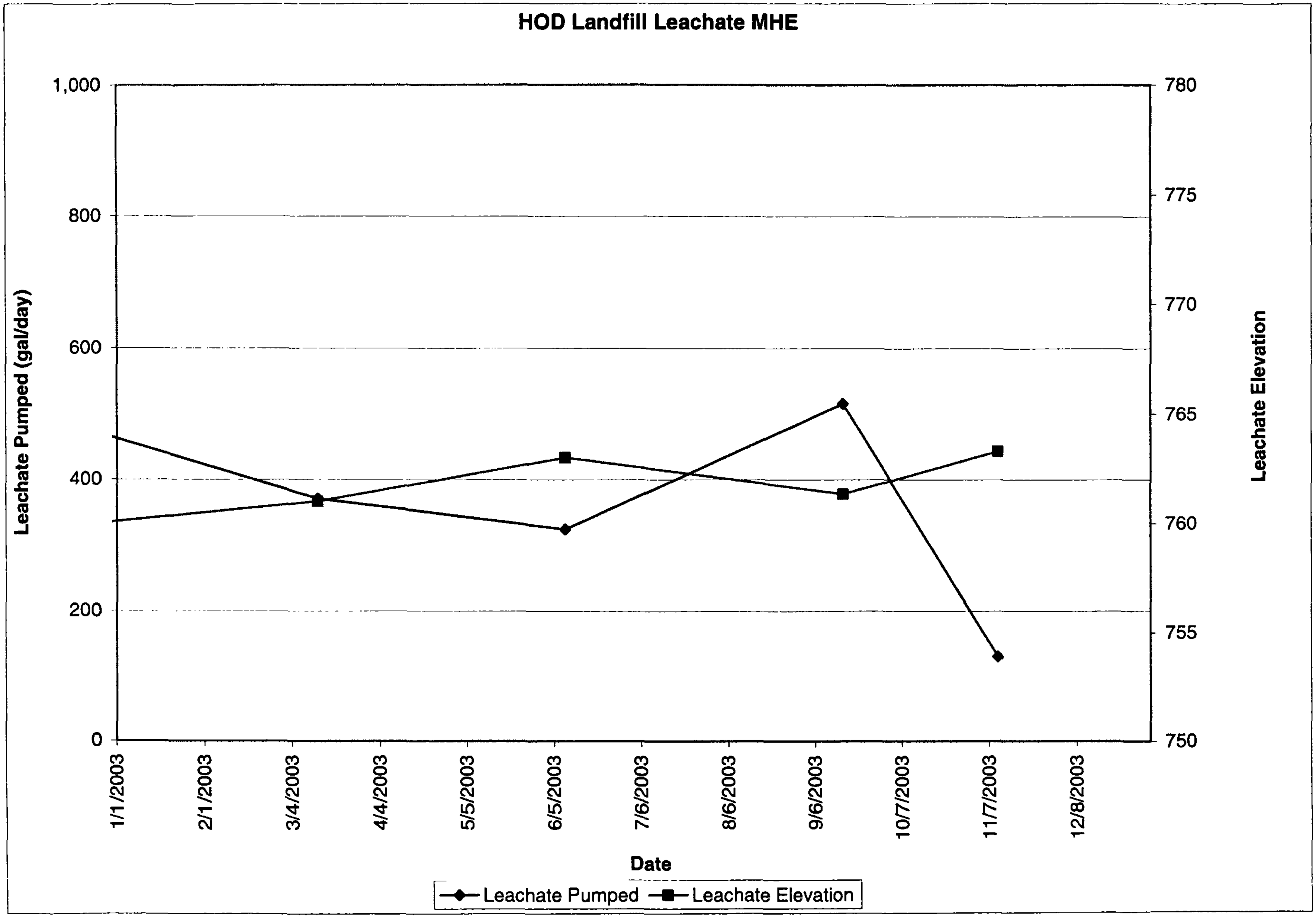
34

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024 XLS 4/23/2004



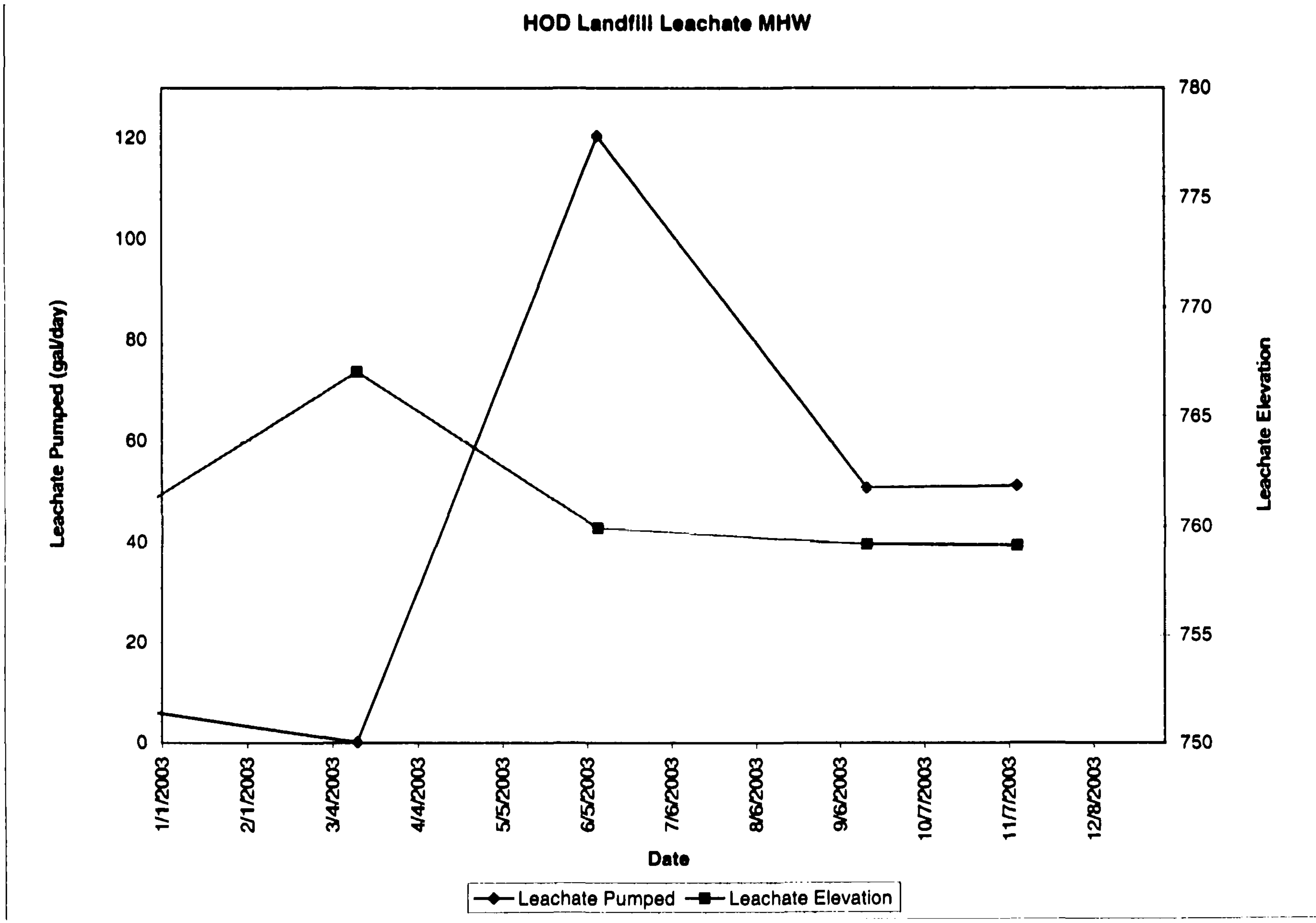
35

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



37

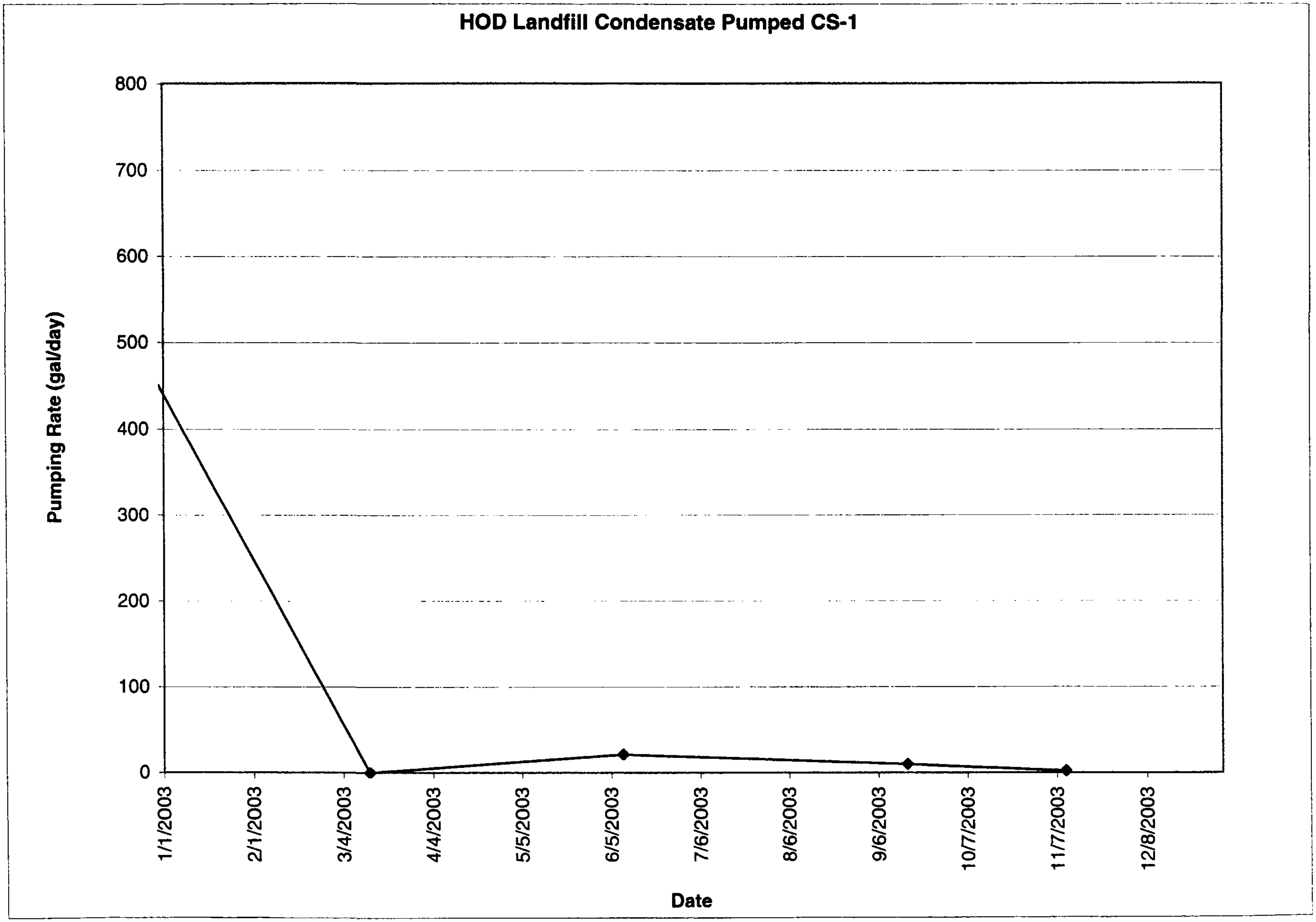
Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004



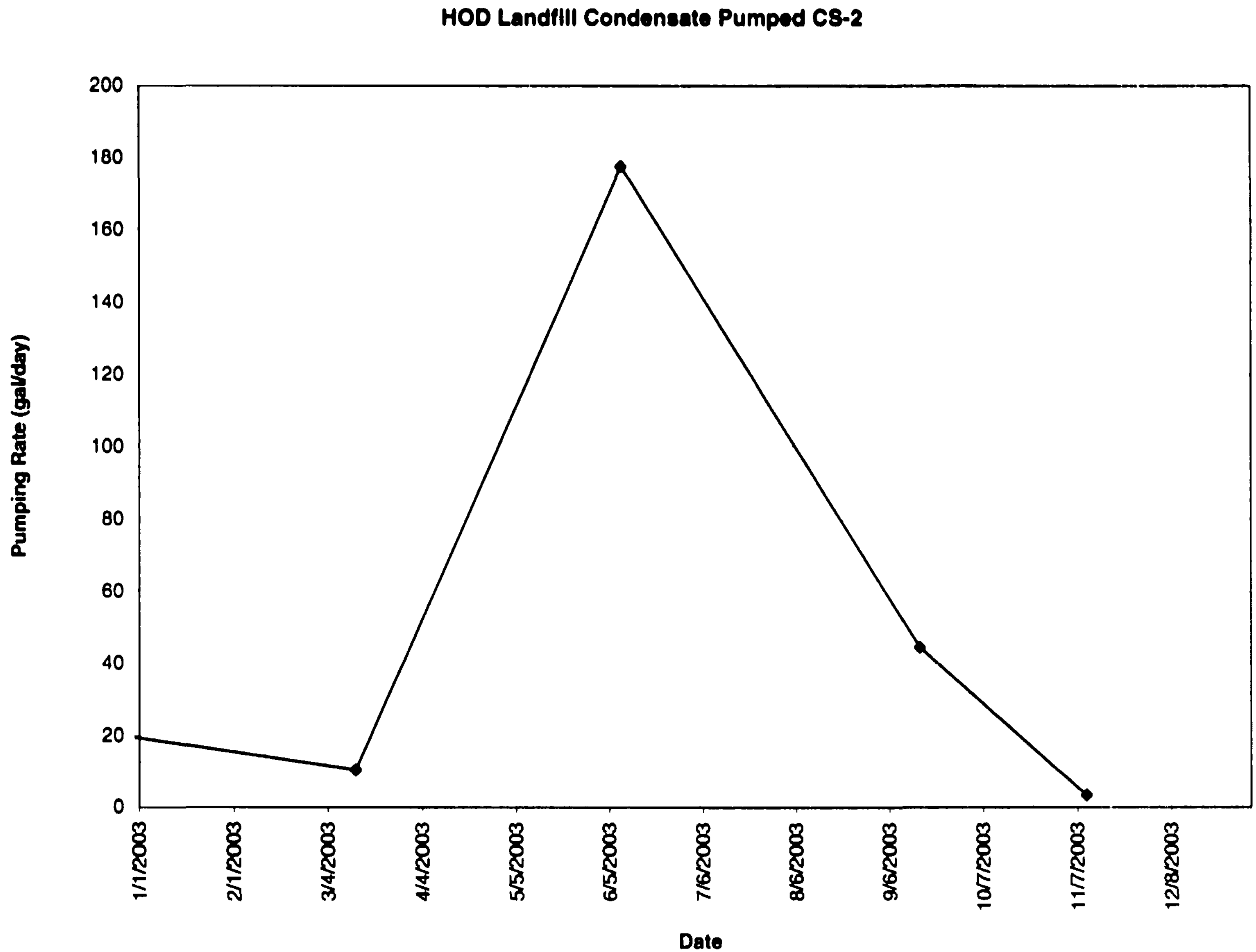
38

Note: Leachate levels are recorded after pumps have been shut down for 48 hours in (February, May, and August) and for 7 days in November. I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 4/23/2004

Condensate Sumps

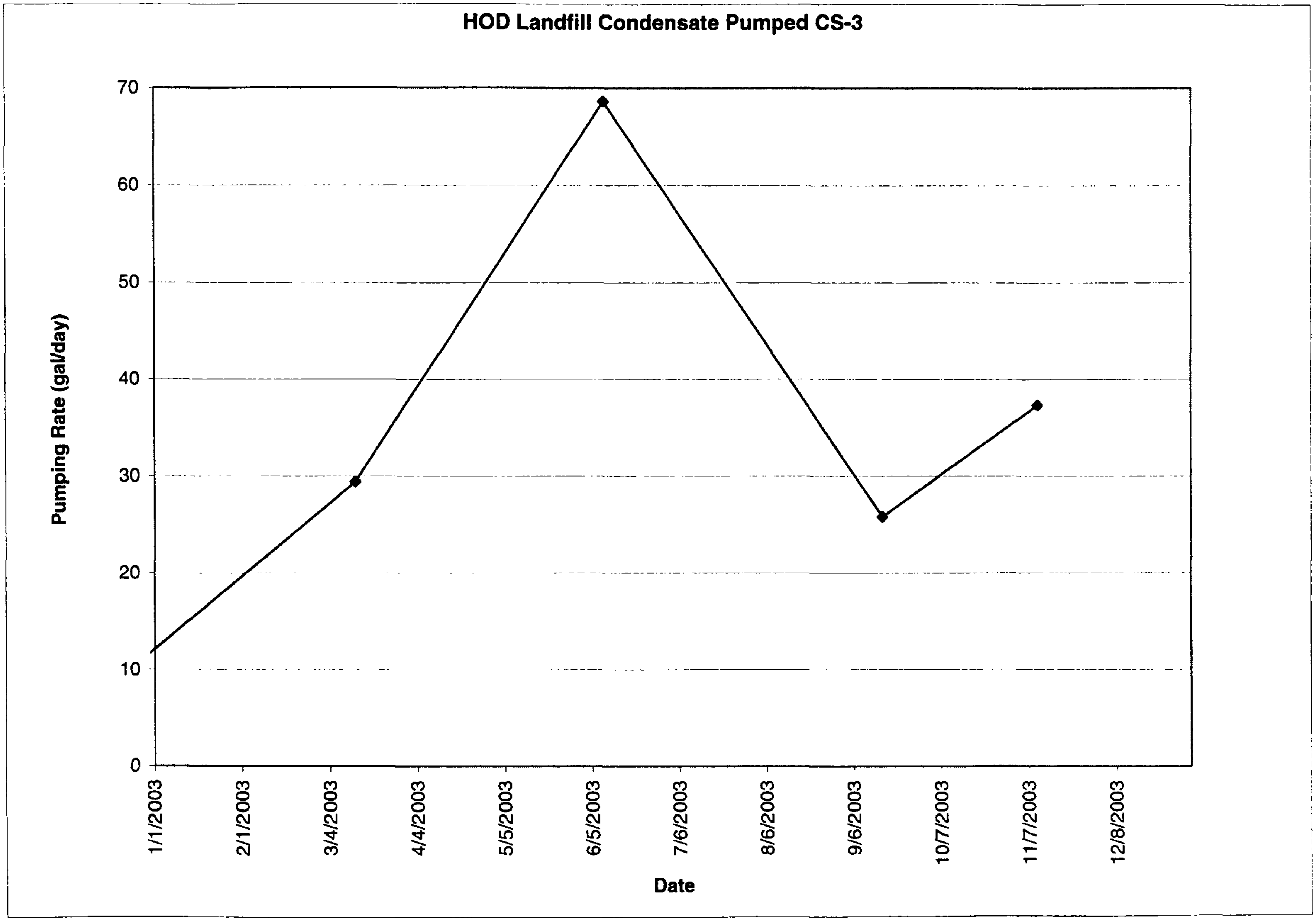

HOD Landfill Condensate Pumped CS-1
Pumping Rate (gal/day)
0
100
200
300
400
500
600
700
800
Date
1/1/2003
2/1/2003
3/4/2003
4/4/2003
5/5/2003
6/5/2003
7/6/2003
8/6/2003
9/6/2003
10/7/2003
11/7/2003
12/8/2003

41

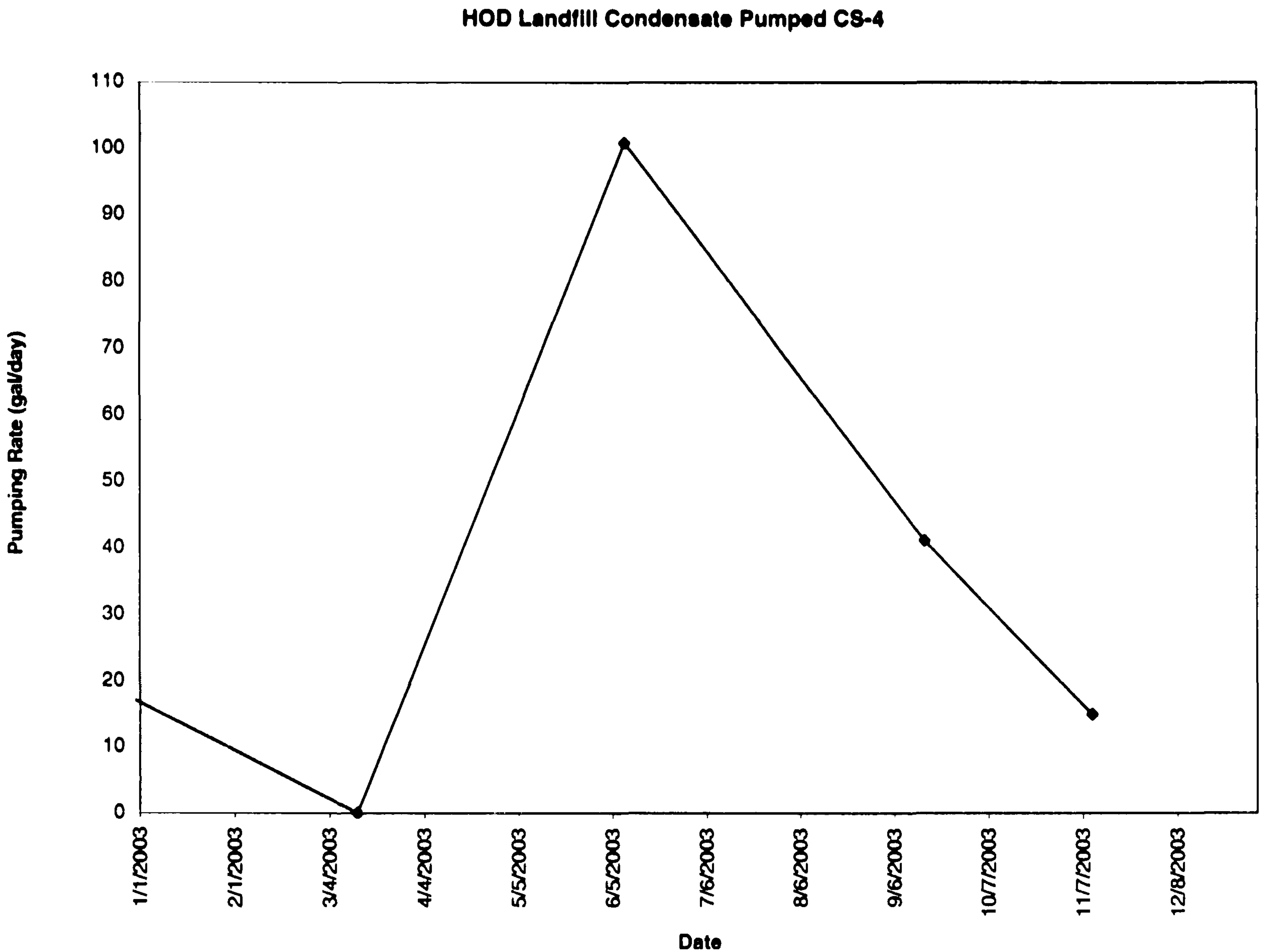


42

I:\WPMSN\PJT\00-05314\41\000531441-024 XLS 3/10/2004


HOD Landfill Condensate Pumped CS-3
Pumping Rate (gal/day)
0
10
20
30
40
50
60
70
1/1/2003
2/1/2003
3/4/2003
4/4/2003
5/5/2003
6/5/2003
7/6/2003
8/6/2003
9/6/2003
10/7/2003
11/7/2003
12/8/2003
Date

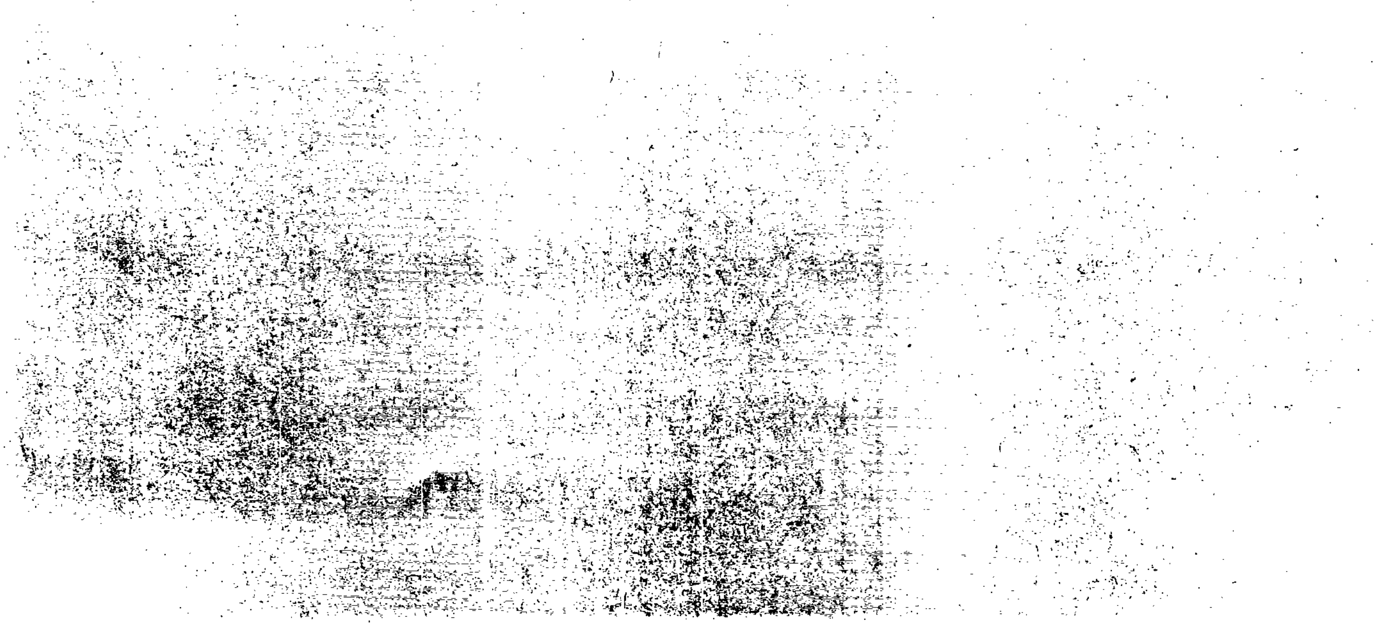
43



I:\WPMSN\PJT\00-05314\41\000531441-024.XLS 3/10/2004

Appendix D
Leachate Analytical Data - Fourth Quarter 2003

Fourth Quarter 2003



2

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS		LCT-01 21-NOV-03 A3B39801	
COLOR, FIELD			ORANGE	
CONDUCTANCE, SPECIFIC	UMHOS/CM		7050	
OXYGEN, DISSOLVED	MG/L		4.44	
EH, FIELD	MV		144	
ODOR, FIELD			LEACH	
PH, FIELD	SU		8.12	
TEMPERATURE	DEG C		13.8	
TURBIDITY, FIELD			MOD	
BOD	MG/L		10700	
CHLORIDE, DISSOLVED	MG/L		1010	
COD	MG/L		1970	
CYANIDE, TOTAL	MG/L		0.012	
CYANIDE, DISSOLVED	MG/L	<	0.01	
FLUORIDE	MG/L		21	
FLUORIDE, DISSOLVED	MG/L		23.5	
GROSS BETA	PCI/L		203	
HARDNESS AS CACO3	MG/L		1270	
NITROGEN, NITRATE, DISSOLVED	MG/L	<	2	
PHENOLICS, TOTAL RECOVERABLE	MG/L		0.43	
RADIUM - 226, DISSOLVED	PCI/L		0.21	
RADIUM - 228, DISSOLVED	PCI/L		1.1	
SOLIDS, TOTAL DISSOLVED	MG/L		3570	hj
SOLIDS, TOTAL SUSPENDED	MG/L	<	4	
STRONTIUM, DISSOLVED	PCI/L		1.15	
SULFATE, DISSOLVED	MG/L		40.4	
TRITIUM	PCI/L	<	330	
ANTIMONY, DISSOLVED	UG/L	<	10	
ARSENIC, DISSOLVED	UG/L	<	10	
ARSENIC, TOTAL	UG/L	<	10	
BARIUM, DISSOLVED	UG/L	<	200	
BARIUM, TOTAL	UG/L		344	
BERYLLIUM, DISSOLVED	UG/L	<	5	
BORON, DISSOLVED	UG/L		4020	

PARAMETER	UNITS		LCT 01 21 NOV 01 A1B39801
CADMIUM, DISSOLVED	UG/L	<	5
CADMIUM, TOTAL	UG/L	<	5
CALCIUM, DISSOLVED	UG/L		199000
CHROMIUM, DISSOLVED	UG/L	<	10
CHROMIUM, TOTAL	UG/L	<	10
COBALT, DISSOLVED	UG/L		12.7
COPPER, DISSOLVED	UG/L	<	10
COPPER, TOTAL	UG/L	<	10
IRON, DISSOLVED	UG/L		164
IRON, TOTAL	UG/L		15800
LEAD, DISSOLVED	UG/L	<	1
LEAD, TOTAL	UG/L		10.1
MAGNESIUM, DISSOLVED	UG/L		187000
MANGANESE, DISSOLVED	UG/L		860
MANGANESE, TOTAL	UG/L		902
MERCURY, DISSOLVED	UG/L	<	0.2
MERCURY, TOTAL	UG/L	<	0.2
NICKEL, DISSOLVED	UG/L		50.8
NICKEL, TOTAL	UG/L		47.1
SELENIUM, DISSOLVED	UG/L		25
SILVER, DISSOLVED	UG/L	<	10
SILVER, TOTAL	UG/L	<	10
THALLIUM, DISSOLVED	UG/L	<	10
ZINC, DISSOLVED	UG/L		59.4
ZINC, TOTAL	UG/L		583
2,4,5 TP (SILVEX)	UG/L	<	2
2,4 D	UG/L	<	10
ALACHLOR	UG/L	<	100
ALDICARB	UG/L	<	0.6
ALPHA-CHLORDANE	UG/L	<	0.05
AROCLOR-1016	UG/L	<	1
AROCLOR-1221	UG/L	<	2
AROCLOR-1232	UG/L	<	1

HOD LANDFILL
4TH QUARTER MONITORING RESULTS
NOVEMBER 2003

PARAMETER	UNITS	LCT-01 21-NOV-03 A3B39801		
AROCLOR-1242	UG/L	<	1	
AROCLOR-1248	UG/L	<	1	
AROCLOR-1254	UG/L	<	1	
AROCLOR-1260	UG/L	<	1	
ATRAZINE	UG/L	<	300	
CARBOFURAN	UG/L	<	0.7	
DALAPON	UG/L	<	1	
ENDRIN	UG/L	<	0.05	
GAMMA-BHC (LINDANE)	UG/L		0.014	JPj
GAMMA-CHLORDANE	UG/L	<	0.05	
HEPTACHLOR	UG/L	<	0.05	
HEPTACHLOR EPOXIDE	UG/L		0.019	JPj
METHOXYCHLOR	UG/L	<	0.05	
PICLORAM	UG/L	<	1	
SIMAZINE	UG/L	<	400	
TOXAPHENE	UG/L	<	1	
1,2-DICHLOROBENZENE	UG/L	<	50	
1,4-DICHLOROBENZENE	UG/L	<	50	
BENZO(A)PYRENE	UG/L	<	18	
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	<	200	
DINOSEB	UG/L	<	1	
HEXACHLOROCYCLOPENTADIENE	UG/L	<	100	
PENTACHLOROPHENOL	UG/L	<	100	
1,1,1-TRICHLOROETHANE	UG/L	<	10	
1,1,2-TRICHLOROETHANE	UG/L	<	10	
1,1-DICHLOROETHENE	UG/L	<	10	
1,2,4-TRICHLOROBENZENE	UG/L	<	10	
1,2-DIBROMO-3-CHLOROPROPANE	UG/L	<	20	
1,2-DIBROMOETHANE	UG/L	<	10	
1,2-DICHLOROETHANE	UG/L	<	10	
1,2-DICHLOROPROPANE	UG/L	<	10	
BENZENE	UG/L		5	J
CARBON TETRACHLORIDE	UG/L	<	10	

HOD LANDFILL
4TH QUARTER MONITORING RESULTS
NOVEMBER 2003

PARAMETER	UNITS	LCT 01 21 NOV 03 A1B19801	
CHLOROBENZENE	UG/L	6	J
CHLOROETHANE	UG/L	< 10	
CIS 1,2-DICHLOROETHENE	UG/L	9	J
ETHYLBENZENE	UG/L	6	J
METHYLENE CHLORIDE	UG/L	22	
STYRENE	UG/L	< 10	
TETRACHLOROETHENE	UG/L	< 10	
TOLUENE	UG/L	17	
TRANS 1,2 DICHLOROETHENE	UG/L	< 10	
TRICHLOROETHENE	UG/L	< 10	
VINYL CHLORIDE	UG/L	< 20	
XYLENE, TOTAL	UG/L	21	

Appendix E
Summary of Detected Constituents Exceeding Leachate, Groundwater, Surface Water, and Purge Water Protection Standards - Fourth Quarter 2003

TABLE 1

PARAMETERS THAT EXCEED

SITE-WIDE LEACHATE PROTECTION STANDARDS

HOD LANDFILL, WASTE MANAGEMENT CORPORATION

BEGINNING SEARCH DATE: 01-NOV-2003

ENDING SEARCH DATE: 01-DEC-2003

CHEMICAL PARAMETER	UNITS	STANDARDS	SAMPLE IDENTIFIER	SAMPLE DATE	RESULT	DATA FLAGS
BOD	MG/L	30	LCT-01	21-NOV-2003	10700	
FLUORIDE	MG/L	15	LCT-01	21-NOV-2003	21	
IRON, TOTAL	UG/L	2000	LCT-01	21-NOV-2003	35800	
PHENOLICS, TOTAL RECOVERABLE	MG/L	.3	LCT-01	21-NOV-2003	0.43	

TABLE 2
PARAMETERS THAT EXCEED
SITE WIDE GROUNDWATER PROTECTION STANDARDS
HOD LANDFILL, WASTE MANAGEMENT CORPORATION

BEGINNING SEARCH DATE: 01 NOV 2003
ENDING SEARCH DATE: 01 DEC 2003

CHEMICAL PARAMETER	UNITS	STANDARDS	SAMPLE IDENTIFIER	SAMPLE DATE	RESULT	DATA FLAGS
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	6	US-01D	20 NOV 2003	27	D
			US-05D	20 NOV 2003	36	D
CIS-1,2-DICHLOROETHENE	UG/L	70	US-03D	20 NOV 2003	170	
IRON, DISSOLVED	UG/L	5000	W-06S	20 NOV 2003	12800	
MANGANESE, DISSOLVED	UG/L	150	PZ-04U	21 NOV 2003	194	
			W-06S	20 NOV 2003	887	
			W-08D	21 NOV 2003	192	
SOLIDS, TOTAL DISSOLVED	MG/L	1200	W-06S	20 NOV 2003	2120	
SULFATE, DISSOLVED	MG/L	400	W-06S	20 NOV 2003	769	
VINYL CHLORIDE	UG/L	2	US-01D	20 NOV 2003	14	J

TABLE 3

PARAMETERS THAT EXCEED

SITE-WIDE SURFACE WATER PROTECTION STANDARDS

HOD LANDFILL, WASTE MANAGEMENT CORPORATION

BEGINNING SEARCH DATE: 01-NOV-2003

ENDING SEARCH DATE: 01-DEC-2003

CHEMICAL PARAMETER	UNITS	STANDARDS	SAMPLE IDENTIFIER	SAMPLE DATE	RESULT	DATA FLAGS

3

TABLE 4
PARAMETERS THAT EXCEED
SITE WIDE PURGE WATER PROTECTION STANDARDS
HOD LANDFILL, WASTE MANAGEMENT CORPORATION

BEGINNING SEARCH DATE: 01 NOV 2003
ENDING SEARCH DATE: 01 DEC 2003

CHEMICAL PARAMETER	UNITS	STANDARDS	SAMPLE IDENTIFIER	SAMPLE DATE	RESULT	DATA FLAGS
IRON, DISSOLVED	UG/L	1000	G 102	19 NOV 2003	3720	
			PZ 03U	21 NOV 2003	4880	
			PZ 04U	21 NOV 2003	3820	
			US 03D	20 NOV 2003	3610	N
			US 04S	19 NOV 2003	3010	
			US 04S DUP	19 NOV 2003	2970	
			US 06S	20 NOV 2003	1670	
			W 03D	21 NOV 2003	1950	
			W 06S	20 NOV 2003	12800	
			W 08D	21 NOV 2003	4100	
SOLIDS, TOTAL DISSOLVED	MG/L	1000	W 06S	20 NOV 2003	2120	

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	AB FIELD BLANK 20-NOV-03 A3B31401	TRIP BLANK 19-NOV-03 A3B27704	TRIP BLANK 20-NOV-03 A3B31406	TRIP BLANK 21-NOV-03 A3B39802	TRIP BLANK 21-NOV-03 A3B39904
ALACHLOR	UG/L	< 1				
ATRAZINE	UG/L	< 3				
ENDOTHALL	UG/L	< 10				
SIMAZINE	UG/L	< 4				
1,2-DICHLOROBENZENE	UG/L	< 0.5				
1,4-DICHLOROBENZENE	UG/L	< 0.5				
BENZO(A)PYRENE	UG/L	< 0.2				
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	< 2				
HEXACHLOROCYCLOPENTADIENE	UG/L	< 1				
PENTACHLOROPHENOL	UG/L	< 1				
1,1,1-TRICHLOROETHANE	UG/L	< 1	< 1	< 1	< 1	< 1
1,1,2-TRICHLOROETHANE	UG/L	< 1	< 1	< 1	< 1	< 1
1,1-DICHLOROETHENE	UG/L	< 1	< 1	< 1	< 1	< 1
1,2-DICHLOROETHENE, TOTAL	UG/L		< 1			
1,2,4-TRICHLOROBENZENE	UG/L	< 1	< 1	< 1	< 1	< 1
1,2-DIBROMO-3-CHLOROPROPANE	UG/L	< 2	< 2	< 2	< 2	< 2
1,2-DIBROMOETHANE	UG/L	< 1	< 1	< 1	< 1	< 1
1,2-DICHLOROETHANE	UG/L	< 1	< 1	< 1	< 1	< 1
1,2-DICHLOROPROPANE	UG/L	< 1	< 1	< 1	< 1	< 1
BENZENE	UG/L	< 1	< 1	< 1	< 1	< 1
CARBON DISULFIDE	UG/L		< 1			
CARBON TETRACHLORIDE	UG/L	< 1	< 1	< 1	< 1	< 1
CHLOROBENZENE	UG/L	< 1	< 1	< 1	< 1	< 1
CHLOROETHANE	UG/L	< 1	< 1	< 1	< 1	< 1
CIS-1,2-DICHLOROETHENE	UG/L	< 1	< 1	< 1	< 1	< 1
ETHYLBENZENE	UG/L	< 1	< 1	< 1	< 1	< 1
METHYLENE CHLORIDE	UG/L	< 1	< 1	< 1	< 1	< 1
STYRENE	UG/L	< 1	< 1	< 1	< 1	< 1
TETRACHLOROETHENE	UG/L	< 1	< 1	< 1	< 1	< 1
TOLUENE	UG/L	< 1	< 1	< 1	< 1	< 1
TRANS-1,2-DICHLOROETHENE	UG/L	< 1	< 1	< 1	< 1	< 1
TRICHLOROETHENE	UG/L	< 1	< 1	< 1	< 1	< 1
VINYL CHLORIDE	UG/L	< 2	< 2	< 2	< 2	< 2

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	AB FIELD BLANK 20 NOV 03 A3K11401	TRIP BLANK 19 NOV 03 A3K27704	TRIP BLANK 20 NOV 03 A3K11406	TRIP BLANK 21 NOV 03 A3K19802	TRIP BLANK 21 NOV 03 A3K19904
XYLENE, TOTAL	UG/L	< 2	< 2	< 2	< 2	< 2

Appendix F
Groundwater Analytical Data - Fourth Quarter 2003

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	G-014S 18-NOV-03 031119-X01	G-102 19-NOV-03 A3B27502	PZ-01 18-NOV-03 031119-X02	PZ-01U 18-NOV-03 031119-X03	PZ-02U 18-NOV-03 031119-X04	PZ-03U 21-NOV-03 A3B39701
COLOR, FIELD			CLEAR				CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM		1458				1000
DEPTH TO WATER	FEET	6.38	10.81	63.20			3.20
OXYGEN, DISSOLVED	MG/L		0.53				0.4
EH, FIELD	MV		-88				-104
ODOR, FIELD			NONE				NONE
PH, FIELD	SU		7.19				7.40
TEMPERATURE	DEG C		11.0				11.0
TURBIDITY, FIELD			NONE				NONE
WATER ELEVATION	FEET	763.96	762.72	725.28			763.07
WELL NOT SAMPLED					00000	00000	

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	PZ 04U 21 NOV 03 A3K19702	PZ 05U 18 NOV 03 031119 X05	PZ 06U 18 NOV 03 031119 X06	R 001D 21 NOV 03 A3K19901	US 01D 20 NOV 03 A3K11402	US 01S 18 NOV 03 031119 X07
COLOR, FIELD		CLEAR			TAN	CLEAR	
CONDUCTANCE, SPECIFIC	UMHOS/CM	912			569	566	
DEPTH TO WATER	FEET	3.25	7.71	3.49	50.54	44.32	3.51
OXYGEN, DISSOLVED	MG/L	0.4			0.39	0.73	
EH, FIELD	MV	9			103	14	
ODOR, FIELD		NONE			NONE	NONE	
PH, FIELD	SU	7.62			8.07	7.96	
TEMPERATURE	DEG C	10.0			10.8	11.1	
TURBIDITY, FIELD		NONE			MOD	NONE	
WATER ELEVATION	FEET	761.24	761.40	761.05	724.14	724.56	765.18
WELL NOT SAMPLED							

HOD LANDFILL
4TH QUARTER MONITORING RESULTS
NOVEMBER 2003

PARAMETER	UNITS	US-02D 19-NOV-03 A3B27702	US-03D 20-NOV-03 A3B31403	US-03I 18-NOV-03 031119-X08	US-03S 18-NOV-03 031119-X09	US-04D 19-NOV-03 A3B27703	US-04S 19-NOV-03 A3B27503
COLOR, FIELD		CLEAR	CLEAR			CLEAR	CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	611	1278			511	1357
DEPTH TO WATER	FEET	46.64	45.14	41.35	8.00	48.30	10.93
OXYGEN, DISSOLVED	MG/L	0.24	1.30			0.96	0.53
EH, FIELD	MV	-90	-86			-14	-58
ODOR, FIELD		NONE	NONE			SL LEACH	SL LEACH
PH, FIELD	SU	7.61	7.53			8.10	7.19
TEMPERATURE	DEG C	11.4	12.2			11.1	11.0
TURBIDITY, FIELD		NONE	NONE			NONE	NONE
WATER ELEVATION	FEET	724.09	724.58	728.58	762.48	724.40	762.74
WELL NOT SAMPLED							

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HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2001

PARAMETER	UNITS	US 05D 20 NOV 01 A1B11404	US 06D 20 NOV 01 A1B11405	US 06I 19 NOV 01 011119 X10	US 06S 20 NOV 01 A1B11501	VW 01 21 NOV 01 A1B40101	W 02D 19 NOV 01 011119 X11
COLOR, FIELD		CLEAR	CLEAR		CLEAR	CLEAR	
CONDUCTANCE, SPECIFIC	UMHOS/CM	479	580		927	110	
DEPTH TO WATER	FEET	41.11	45.68	25.81	6.94		48.16
OXYGEN, DISSOLVED	MG/L	0.11	0.49		0.20	8.49	
EH, FIELD	MV	95	102		81	89	
ODOR, FIELD		NONE	NONE		NONE	NONE	
PH, FIELD	SU	8.41	8.15		7.11	8.01	
TEMPERATURE	DEG C	10.5	10.9		10.7	11.1	
TURBIDITY, FIELD		NONE	NONE		NONE	NONE	
WATER ELEVATION	FEET	724.62	724.41	744.40	762.96		724.88

WELL NOT SAMPLED

HOD LANDFILL
4TH QUARTER MONITORING RESULTS
NOVEMBER 2003

PARAMETER	UNITS	W-03D 21-NOV-03 A3B39902	W-03SA 18-NOV-03 031119-X13	W-03SB 18-NOV-03 031119-X14	W-04S 18-NOV-03 031119-X15	W-05S 18-NOV-03 031119-X16	W-06S 20-NOV-03 A3B31502
COLOR, FIELD		CLEAR					CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	1114					2610
DEPTH TO WATER	FEET	41.52	3.76	3.97	7.54	10.50	4.31
OXYGEN, DISSOLVED	MG/L	0.4					0.37
EH, FIELD	MV	-91					-91
ODOR, FIELD		NONE					SL LEACH
PH, FIELD	SU	7.30					7.03
TEMPERATURE	DEG C	11.5					11.5
TURBIDITY, FIELD		NONE					NONE
WATER ELEVATION	FEET	724.41	762.78	762.84	762.43	762.99	763.10
WELL NOT SAMPLED							

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	W 08D 21 NOV 03 A3K19903
COLOR, FIELD		CLEAR
CONDUCTANCE, SPECIFIC	UMHOS/CM	965
DEPTH TO WATER	FEET	43.54
OXYGEN, DISSOLVED	MG/L	0.22
EH, FIELD	MV	85
ODOR, FIELD		NONE
PH, FIELD	SU	7.44
TEMPERATURE	DEG C	10.1
TURBIDITY, FIELD		NONE
WATER ELEVATION	FEET	724.60
WELL NOT SAMPLED		

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	G-102	PZ-03U	PZ-04U	R-001D	US-01D	US-02D
		19-NOV-03	21-NOV-03	21-NOV-03	21-NOV-03	20-NOV-03	19-NOV-03
		A3B27502	A3B39701	A3B39702	A3B39901	A3B31402	A3B27702
ALKALINITY AS CACO3	MG/L				300	300	464 j
BOD	MG/L				7	< 2	< 2
CHLORIDE, DISSOLVED	MG/L	188	71.5	54.9	4.2	26	6.2
CYANIDE, DISSOLVED	MG/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
FLUORIDE, DISSOLVED	MG/L	< 0.5	< 0.5	< 0.5	0.64	< 0.5	0.71
GROSS BETA	PCI/L	< 7.4	< 6.2	< 6.2	< 3.7	< 2.9	< 2.7
HARDNESS AS CACO3	MG/L	547	536	614	216	266	247
NITROGEN, AMMONIA	MG/L				0.34	0.72	1.3
NITROGEN, NITRATE	MG/L				< 2	< 2	< 2
NITROGEN, NITRATE, DISSOLVED	MG/L	< 2	< 2	< 2	< 2	< 2	< 2
NITROGEN, NITRITE	MG/L				< 0.05	< 0.05	< 0.05
NITROGEN, TOTAL KJELDAHL	MG/L				0.57	1.4	1.8
PHENOLICS, TOTAL RECOVERABLE	MG/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
PHOSPHORUS, ORTHO	MG/L				< 0.02	0.053	0.13
RADIUM - 226, DISSOLVED	PCI/L	1.5	0.61	0.65	0.23	0.4 J	< 0.25
RADIUM - 228, DISSOLVED	PCI/L	0.8 J	< 1.1	< 0.98	< 0.9	< 0.8	< 0.99
SOLIDS, TOTAL DISSOLVED	MG/L	835	339	536	310	378	372
STRONTIUM, DISSOLVED	PCI/L	< 0.52	< 0.6	< 0.67	< 0.69	< 0.58	< 0.68
SULFATE	MG/L				94.8	64.5	90.2
SULFATE, DISSOLVED	MG/L	124	25.3	82.2	43.8	60.7	96.6
SULFIDE, TOTAL	MG/L				< 1	< 1	< 1
TOTAL ORGANIC CARBON AS NPOC	MG/L				1.8	2.9	2.4
TRITIUM	PCI/L	< 96	-30	40	< 320	< 95	29
ANTIMONY, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
ARSENIC, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
BARIUM, DISSOLVED	UG/L	< 200	< 200	< 200	< 200	< 200 N	< 200
BERYLLIUM, DISSOLVED	UG/L	< 5	< 5	< 5	< 5	< 5	< 25 N
BORON, DISSOLVED	UG/L	248	< 100	< 100	304	363 N	304
CADMIUM, DISSOLVED	UG/L	< 5	< 5	< 5	< 5	< 5	< 5
CALCIUM, DISSOLVED	UG/L	124000	126000	140000	42200	48800	47300
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COBALT, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	G 102 19 NOV 03 A1B27502		PZ 01U 21 NOV 03 A1B19701		PZ 04U 21 NOV 03 A1B19702		R 001D 21 NOV 03 A1B19901		UB 01D 20 NOV 03 A1B31402			UB 02D 19 NOV 03 A1B27702	
COPPER, DISSOLVED	UG/L	<	10	<	10	<	10	<	10	<	10		<	10
IRON, DISSOLVED	UG/L		3720		4880		3820		467		593	N		882
LEAD, DISSOLVED	UG/L	<	3	<	3	<	3	<	3	<	3		<	3
MAGNESIUM, DISSOLVED	UG/L		57600		51900		64200		27000		14900	N		11300
MANGANESE, DISSOLVED	UG/L		78.4		129		194		11		11.8			22
MERCURY, DISSOLVED	UG/L	<	0.2	<	0.2	<	0.2	<	0.2	<	0.2		<	0.2
NICKEL, DISSOLVED	UG/L	<	10	<	10	<	10	<	10	<	10		<	10
SELENIUM, DISSOLVED	UG/L	<	5	<	5	<	5	<	5	<	5		<	5
SILVER, DISSOLVED	UG/L	<	10	<	10	<	10	<	10	<	10		<	10
THALLIUM, DISSOLVED	UG/L	<	10	<	10	<	10	<	10	<	10		<	10
ZINC, DISSOLVED	UG/L	<	20	<	20	<	20	<	20	<	20		<	20

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	US-03D		US-04D		US-04D DUP		US-04S		US-04S DUP		US-05D	
		20-NOV-03		19-NOV-03		19-NOV-03		19-NOV-03		19-NOV-03		20-NOV-03	
		A3B31403		A3B27703		A3B27701		A3B27503		A3B27501		A3B31404	
ALKALINITY AS CACO3	MG/L	390		437	j	436						190	
BOD	MG/L	< 2		< 2		< 2						< 2	
CHLORIDE, DISSOLVED	MG/L	161		3		2.9		180		181		1.6	
CYANIDE, DISSOLVED	MG/L	< 0.01		< 0.01		< 0.01		< 0.01		< 0.01		< 0.01	
FLUORIDE, DISSOLVED	MG/L	< 0.5		0.93		0.95		< 0.5		< 0.5		0.94	
GROSS BETA	PCI/L	< 6.4		< 2.5		< 2		< 6.2		< 5.9		< 1.9	
HARDNESS AS CACO3	MG/L	548		170		170		504		497		146	
NITROGEN, AMMONIA	MG/L	0.26		0.77		0.77						0.3	
NITROGEN, NITRATE	MG/L	< 2		< 2		< 2	hj					< 2	
NITROGEN, NITRATE, DISSOLVED	MG/L	< 2		< 2		< 2		< 2		< 2		< 2	
NITROGEN, NITRITE	MG/L	< 0.05		< 0.05		0.098						< 0.05	
NITROGEN, TOTAL KJELDAHL	MG/L	0.65		1		1.2						0.56	
PHENOLICS, TOTAL RECOVERABLE	MG/L	< 0.005		< 0.005		< 0.005		0.0052		< 0.005		0.0059	
PHOSPHORUS, ORTHO	MG/L	0.32	j	0.2		0.18						< 0.02	
RADIUM - 226, DISSOLVED	PCI/L	0.64	J	0.34	J	< 0.23		1		0.77		0.22	J
RADIUM - 228, DISSOLVED	PCI/L	1.1		< 1		< 0.72		0.81	J	< 0.75		< 0.8	
SOLIDS, TOTAL DISSOLVED	MG/L	691		280		334		773		809		271	
STRONTIUM, DISSOLVED	PCI/L	< 0.52		< 0.52		< 0.5		< 0.54		< 0.5		< 0.53	
SULFATE	MG/L	76.2		74.4		62.2						71.4	
SULFATE, DISSOLVED	MG/L	57		70.8		172		80.6		77.9		72.5	
SULFIDE, TOTAL	MG/L	< 1		< 1		< 1						< 1	
TOTAL ORGANIC CARBON AS NPOC	MG/L	1.8		2.4		2.5						1.3	
TRITIUM	PCI/L	< 94		65		49		< 96		< 95		< 97	
ANTIMONY, DISSOLVED	UG/L	< 10		< 10		< 10		< 10		< 10		< 10	
ARSENIC, DISSOLVED	UG/L	< 10		< 10		< 10		< 10		< 10		< 10	
BARIUM, DISSOLVED	UG/L	< 200	N	< 200		< 200		< 200		< 200		< 200	N
BERYLLIUM, DISSOLVED	UG/L	< 5		< 25	N	< 25	N	< 5		< 5		< 5	
BORON, DISSOLVED	UG/L	173	N	415		420		231		233		604	N
CADMIUM, DISSOLVED	UG/L	< 5		< 5		< 5		< 5		< 5		< 5	
CALCIUM, DISSOLVED	UG/L	120000		33100		33100		117000		115000		24700	
CHROMIUM, DISSOLVED	UG/L	< 10		< 10		< 10		< 10		< 10		< 10	
COBALT, DISSOLVED	UG/L	< 10		< 10		< 10		< 10		< 10		< 10	

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	UG 03D 20 NOV 03 A3K11403			UG 04D 19 NOV 03 A3K27703		UG 04D DUP 19 NOV 03 A3K27701		UG 04S 19 NOV 03 A3K27503		UG 04S DUP 19 NOV 03 A3K27501		UG 05D 20 NOV 03 A3K11404	
COPPER, DISSOLVED	UG/L	<	10		<	10	<	10	<	10	<	10	<	10	
IRON, DISSOLVED	UG/L		3610	N	<	100	<	100		3010		2970	<	100	N
LEAD, DISSOLVED	UG/L	<	3		<	3	<	3	<	3	<	3	<	3	
MAGNESIUM, DISSOLVED	UG/L		60300	N		21200		21300		51500		51100		20500	N
MANGANESE, DISSOLVED	UG/L		41.5			6.8		7		81.4		80.8		11.8	
MERCURY, DISSOLVED	UG/L	<	0.2		<	0.2	<	0.2	<	0.2	<	0.2	<	0.2	
NICKEL, DISSOLVED	UG/L	<	10		<	10	<	10	<	10	<	10	<	10	
SELENIUM, DISSOLVED	UG/L	<	5		<	5	<	5	<	5	<	5	<	5	
SILVER, DISSOLVED	UG/L	<	10		<	10	<	10	<	10	<	10	<	10	
THALLIUM, DISSOLVED	UG/L	<	10		<	10	<	10	<	10	<	10	<	10	
ZINC, DISSOLVED	UG/L	<	20		<	20	<	20	<	20	<	20	<	20	

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	US-06D 20-NOV-03 A3B31405	US-06S 20-NOV-03 A3B31501	VW-03 21-NOV-03 A3B40301	W-03D 21-NOV-03 A3B39902	W-06S 20-NOV-03 A3B31502	W-08D 21-NOV-03 A3B39903
ALKALINITY AS CACO3	MG/L	184		365	400		360
BOD	MG/L	< 2		< 2	< 2		< 2
CHLORIDE, DISSOLVED	MG/L	3.7	62.4	16.8	138	140	75
CYANIDE, DISSOLVED	MG/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
FLUORIDE, DISSOLVED	MG/L	0.88	< 0.5	0.74	< 0.5	< 0.5	< 0.5
GROSS BETA	PCI/L	3.7 J	< 5.5	< 4.4	< 7.1	24	< 5.3
HARDNESS AS CACO3	MG/L	181	489	279	492	1840	465
NITROGEN, AMMONIA	MG/L	1.1		0.55	0.13		0.37
NITROGEN, NITRATE	MG/L	< 2		< 2	< 2		< 2
NITROGEN, NITRATE, DISSOLVED	MG/L	< 2	< 2	< 2	< 2	< 2	< 2
NITROGEN, NITRITE	MG/L	< 0.05		< 0.05	< 0.05		< 0.05
NITROGEN, TOTAL KJELDAHL	MG/L	1.8		0.61	0.45		0.71
PHENOLICS, TOTAL RECOVERABLE	MG/L	0.0051	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
PHOSPHORUS, ORTHO	MG/L	0.2		< 0.02	0.11		< 0.02
RADIUM - 226, DISSOLVED	PCI/L	< 0.17	0.54 J	0.2	0.17	0.43 J	0.27
RADIUM - 228, DISSOLVED	PCI/L	< 0.75	< 0.69	< 0.81	< 0.81	1	< 0.82
SOLIDS, TOTAL DISSOLVED	MG/L	347	521	337	674	2120	509
STRONTIUM, DISSOLVED	PCI/L	< 0.6	< 0.5	< 0.61	< 0.63	1.42 J	< 0.64
SULFATE	MG/L	130		53	108		56
SULFATE, DISSOLVED	MG/L	137	47.2	61.1	126	769	61.3
SULFIDE, TOTAL	MG/L	< 1		< 1	< 1		< 1
TOTAL ORGANIC CARBON AS NPOC	MG/L	1.8		1.4	1.6		4.8
TRITIUM	PCI/L	< 96	108 J	< 320	< 320	< 94	1810
ANTIMONY, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
ARSENIC, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
BARIUM, DISSOLVED	UG/L	< 200 N	< 200	< 200	< 200	< 200	< 200
BERYLLIUM, DISSOLVED	UG/L	< 5	< 5	< 5	< 5	< 5	< 5
BORON, DISSOLVED	UG/L	557 N	< 100	423	< 100	111	110
CADMIUM, DISSOLVED	UG/L	< 5	< 5	< 5	< 5	< 5	< 5
CALCIUM, DISSOLVED	UG/L	37400	113000	50300	94600	450000	106000
CHROMIUM, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
COBALT, DISSOLVED	UG/L	< 10	< 10	< 10	< 10	< 10	< 10

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	UB 06D 20 NOV 03 A3K11405		UB 06S 20 NOV 03 A3K11501		VW 03 21 NOV 03 A3K40101		W 03D 21 NOV 03 A3K19902		W 06S 20 NOV 03 A3K11502		W 08D 21 NOV 03 A3K19903	
COPPER, DISSOLVED	UG/L	< 10		< 10		< 10		< 10		< 10		< 10	
IRON, DISSOLVED	UG/L	675	N	3670		883		1950		12800		4100	
LEAD, DISSOLVED	UG/L	< 3		< 3		< 3		< 3		< 3		< 3	
MAGNESIUM, DISSOLVED	UG/L	21200	N	50200		17100		62200		173000		48600	
MANGANESE, DISSOLVED	UG/L	23.6		81.9		11.4		123		887		192	
MERCURY, DISSOLVED	UG/L	< 0.2		< 0.2		< 0.2		< 0.2		< 0.2		< 0.2	
NICKEL, DISSOLVED	UG/L	< 10		< 10		< 10		< 10		< 10		< 10	
SELENIUM, DISSOLVED	UG/L	< 5		< 5		< 5		< 5		< 5		< 5	
SILVER, DISSOLVED	UG/L	< 10		< 10		< 10		< 10		< 10		< 10	
THALLIUM, DISSOLVED	UG/L	< 10		< 10		< 10		< 10		< 10		< 10	
ZINC, DISSOLVED	UG/L	< 20		< 20		< 20		< 20		< 20		< 20	

HOD LANDFILL
4TH QUARTER MONITORING RESULTS
NOVEMBER 2003

PARAMETER	UNITS	G-102 19-NOV-03 A3B27502	PZ-03U 21-NOV-03 A3B39701	PZ-04U 21-NOV-03 A3B39702	R-001D 21-NOV-03 A3B39901	US-01D 20-NOV-03 A3B31402	US-02D 19-NOV-03 A3B27702
2,4,5-TP (SILVEX)	UG/L	< 2	< 2	< 2	< 2	< 2	< 2
2,4-D	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
ALACHLOR	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
ALDICARB	UG/L	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
ALPHA-CHLORDANE	UG/L	< 0.048	< 0.05	< 0.049	< 0.05	< 0.047	< 0.048
AROCLOR-1016	UG/L	< 0.95	< 1	< 0.98	< 1	< 0.94	< 0.96
AROCLOR-1221	UG/L	< 1.9	< 2	< 2	< 2	< 1.9	< 1.9
AROCLOR-1232	UG/L	< 0.95	< 1	< 0.98	< 1	< 0.94	< 0.96
AROCLOR-1242	UG/L	< 0.95	< 1	< 0.98	< 1	< 0.94	< 0.96
AROCLOR-1248	UG/L	< 0.95	< 1	< 0.98	< 1	< 0.94	< 0.96
AROCLOR-1254	UG/L	< 0.95	< 1	< 0.98	< 1	< 0.94	< 0.96
AROCLOR-1260	UG/L	< 0.95	< 1	< 0.98	< 1	< 0.94	< 0.96
ATRAZINE	UG/L	< 3	< 3	< 3	< 3	< 3	< 3
CARBOFURAN	UG/L	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
DALAPON	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
ENDOTHALL	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
ENDRIN	UG/L	< 0.048	< 0.05	< 0.049	< 0.05	< 0.047	< 0.048
GAMMA-BHC (LINDANE)	UG/L	< 0.048	< 0.05	< 0.049	< 0.05	< 0.047	< 0.048
GAMMA-CHLORDANE	UG/L	< 0.048	< 0.05	< 0.049	< 0.05	< 0.047	< 0.048
HEPTACHLOR	UG/L	< 0.048	< 0.05	< 0.049	< 0.05	< 0.047	< 0.048
HEPTACHLOR EPOXIDE	UG/L	< 0.048	< 0.05	< 0.049	< 0.05	< 0.047	< 0.048
METHOXYCHLOR	UG/L	< 0.048	< 0.05	< 0.049	< 0.05	< 0.047	< 0.048
PICLORAM	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
SIMAZINE	UG/L	< 4	< 4	< 4	< 4	< 4	< 4
TOXAPHENE	UG/L	< 0.95	< 1	< 0.98	< 1	< 0.94	< 0.96
1,2-DICHLOROBENZENE	UG/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.6	< 0.5
1,4-DICHLOROBENZENE	UG/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.6	< 0.5
BENZO(A)PYRENE	UG/L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	< 2	< 2	< 2	< 2	27 D	< 2
DINOSEB	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
HEXACHLOROCYCLOPENTADIENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
PENTACHLOROPHENOL	UG/L	< 1	< 1	< 1	< 1	< 1	< 1

PARAMETER	UNITS	UB 03D 20 NOV 03 A3B11403	UB 04D 19 NOV 03 A3B27703	UB 04D DUP 19 NOV 03 A3B27701	UB 04S 19 NOV 03 A3B27503	UB 04S DUP 19 NOV 03 A3B27501	UB 05D 20 NOV 03 A3B11404
2,4,5 TP (SILVEX)	UG/L	< 2	< 2	< 2	< 2	< 2	< 2
2,4 D	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
ALACHLOR	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
ALDICARB	UG/L	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
ALPHA CHLORDANE	UG/L	< 0.048	< 0.05	< 0.05	< 0.058	< 0.054	< 0.048
AROCLOR 1016	UG/L	< 0.96	< 1	< 1	< 1.2	< 1.1	< 0.96
AROCLOR 1221	UG/L	< 1.9	< 2	< 2	< 2.3	< 2.2	< 1.9
AROCLOR 1232	UG/L	< 0.96	< 1	< 1	< 1.2	< 1.1	< 0.96
AROCLOR 1242	UG/L	< 0.96	< 1	< 1	< 1.2	< 1.1	< 0.96
AROCLOR 1248	UG/L	< 0.96	< 1	< 1	< 1.2	< 1.1	< 0.96
AROCLOR 1254	UG/L	< 0.96	< 1	< 1	< 1.2	< 1.1	< 0.96
AROCLOR 1260	UG/L	< 0.96	< 1	< 1	< 1.2	< 1.1	< 0.96
ATRAZINE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
CARBOFURAN	UG/L	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
DALAPON	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
ENDOTHALL	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
ENDRIN	UG/L	< 0.048	< 0.05	< 0.05	< 0.058	< 0.054	< 0.048
GAMMA BHC (LINDANE)	UG/L	< 0.048	< 0.05	< 0.05	< 0.058	< 0.054	< 0.048
GAMMA CHLORDANE	UG/L	< 0.048	< 0.05	< 0.05	< 0.058	< 0.054	< 0.048
HEPTACHLOR	UG/L	< 0.048	< 0.05	< 0.05	< 0.058	< 0.054	< 0.048
HEPTACHLOR EPOXIDE	UG/L	< 0.048	< 0.05	< 0.05	< 0.058	< 0.054	< 0.048
METHOXYCHLOR	UG/L	< 0.048	< 0.05	< 0.05	< 0.058	< 0.054	< 0.048
PICLORAM	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
SIMAZINE	UG/L	< 4	< 4	< 4	< 4	< 4	< 4
TOXAPHENE	UG/L	< 0.96	< 1	< 1	< 1.2	< 1.1	< 0.96
1,2 DICHLOROBENZENE	UG/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,4 DICHLOROBENZENE	UG/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
BENZO(A)PYRENE	UG/L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	< 2	< 2	< 2	< 2	< 2	36 D
DINOSEB	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
HEXACHLOROCYCLOPENTADIENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
PENTACHLOROPHENOL	UG/L	< 1	< 1	< 1	< 1	< 1	< 1

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	US-06D 20-NOV-03 A3B31405	US-06S 20-NOV-03 A3B31501	VW-03 21-NOV-03 A3B40301	W-03D 21-NOV-03 A3B39902	W-06S 20-NOV-03 A3B31502	W-08D 21-NOV-03 A3B39903
2,4,5-TP (SILVEX)	UG/L	< 2	< 2	< 2	< 2	< 2	< 2
2,4-D	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
ALACHLOR	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
ALDICARB	UG/L	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
ALPHA-CHLORDANE	UG/L	< 0.049	< 0.048	< 0.05	< 0.049	< 0.049	< 0.048
AROCLOR-1016	UG/L	< 0.98	< 0.96	< 1	< 0.98	< 0.97	< 0.96
AROCLOR-1221	UG/L	< 2	< 1.9	< 2	< 2	< 1.9	< 1.9
AROCLOR-1232	UG/L	< 0.98	< 0.96	< 1	< 0.98	< 0.97	< 0.96
AROCLOR-1242	UG/L	< 0.98	< 0.96	< 1	< 0.98	< 0.97	< 0.96
AROCLOR-1248	UG/L	< 0.98	< 0.96	< 1	< 0.98	< 0.97	< 0.96
AROCLOR-1254	UG/L	< 0.98	< 0.96	< 1	< 0.98	< 0.97	< 0.96
AROCLOR-1260	UG/L	< 0.98	< 0.96	< 1	< 0.98	< 0.97	< 0.96
ATRAZINE	UG/L	< 3	< 4	< 3	< 3	< 3	< 3
CARBOFURAN	UG/L	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
DALAPON	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
ENDOTHALL	UG/L	< 10	< 10	< 10	< 10	< 10	< 10
ENDRIN	UG/L	< 0.049	< 0.048	< 0.05	< 0.049	< 0.049	< 0.048
GAMMA-BHC (LINDANE)	UG/L	< 0.049	< 0.048	< 0.05	< 0.049	< 0.049	< 0.048
GAMMA-CHLORDANE	UG/L	< 0.049	< 0.048	< 0.05	< 0.049	< 0.049	< 0.048
HEPTACHLOR	UG/L	< 0.049	< 0.048	< 0.05	< 0.049	< 0.049	< 0.048
HEPTACHLOR EPOXIDE	UG/L	< 0.049	< 0.048	< 0.05	< 0.049	< 0.049	< 0.048
METHOXYCHLOR	UG/L	< 0.049	< 0.048	< 0.05	< 0.049	< 0.049	< 0.048
PICLORAM	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
SIMAZINE	UG/L	< 4	< 5	< 4	< 4	< 4	< 4
TOXAPHENE	UG/L	< 0.98	< 0.96	< 1	< 0.98	< 0.97	< 0.96
1,2-DICHLOROBENZENE	UG/L	< 0.5	< 0.6	< 0.5	< 0.5	< 0.5	< 0.5
1,4-DICHLOROBENZENE	UG/L	< 0.5	< 0.6	< 0.5	< 0.5	< 0.5	< 0.5
BENZO(A)PYRENE	UG/L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	< 2	< 2	< 2	< 2	< 2	< 2
DINOSEB	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
HEXACHLOROCYCLOPENTADIENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
PENTACHLOROPHENOL	UG/L	< 1	< 1	< 1	< 1	< 1	< 1

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	G 102 19 NOV 03 A3K27502	PZ 01U 21 NOV 03 A3K19701	PZ 04U 21 NOV 03 A3K19702	R 001D 21 NOV 03 A3K19901	US 01D 20 NOV 03 A3K11402	US 02D 19 NOV 03 A3K27702
1,1,1 TRICHLOROETHANE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2 TRICHLOROETHANE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
1,1 DICHLOROETHENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4 TRICHLOROBENZENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
1,2 DIBROMO 3 CHLOROPROPANE	UG/L	< 2	< 2	< 2	< 2	< 2	< 2
1,2 DIBROMOETHANE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
1,2 DICHLOROETHANE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
1,2 DICHLOROPROPANE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
BENZENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
CARBON TETRACHLORIDE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
CHLOROBENZENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
CHLOROETHANE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
CIS 1,2 DICHLOROETHENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
ETHANE	UG/L				< 15	< 15	< 15
ETHENE	UG/L				< 13	< 13	< 13
ETHYLBENZENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
METHANE	UG/L				9.6	< 8	< 8
METHYLENE CHLORIDE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
STYRENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
TETRACHLOROETHENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
TOLUENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
TRANS 1,2 DICHLOROETHENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
TRICHLOROETHENE	UG/L	< 1	< 1	< 1	< 1	< 1	< 1
VINYL CHLORIDE	UG/L	< 2	< 2	< 2	< 2	< 2	< 2
XYLENE, TOTAL	UG/L	< 2	< 2	< 2	< 2	< 2	< 2

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	US-03D 20-NOV-03 A3B31403			US-04D 19-NOV-03 A3B27703		US-04D DUP 19-NOV-03 A3B27701		US-04S 19-NOV-03 A3B27503			US-04S DUP 19-NOV-03 A3B27501			US-05D 20-NOV-03 A3B31404	
1,1,1-TRICHLOROETHANE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
1,1,2-TRICHLOROETHANE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
1,1-DICHLOROETHENE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
1,2,4-TRICHLOROBENZENE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
1,2-DIBROMO-3-CHLOROPROPANE	UG/L	<	20		<	2	<	2	<	4		<	2		<	2
1,2-DIBROMOETHANE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
1,2-DICHLOROETHANE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
1,2-DICHLOROPROPANE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
BENZENE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
CARBON TETRACHLORIDE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
CHLOROBENZENE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
CHLOROETHANE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
CIS-1,2-DICHLOROETHENE	UG/L		170		<	1	<	1		34			34	D	<	1
ETHANE	UG/L	<	15		<	15	<	15							<	15
ETHENE	UG/L	<	13		<	13	<	13							<	13
ETHYLBENZENE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
METHANE	UG/L		47			9.8		12							<	8
METHYLENE CHLORIDE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
STYRENE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
TETRACHLOROETHENE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
TOLUENE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
TRANS-1,2-DICHLOROETHENE	UG/L		45		<	1	<	1		2			2		<	1
TRICHLOROETHENE	UG/L	<	10		<	1	<	1	<	2		<	1		<	1
VINYL CHLORIDE	UG/L		14	J	<	2	<	2		0.9	J		1	J	<	2
XYLENE, TOTAL	UG/L	<	20		<	2	<	2	<	4		<	2		<	2

HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2001

PARAMETER	UNITS	UB 06D 20 NOV 01 A1B11405	VW 01 21 NOV 01 A1B40301	W 03D 21 NOV 01 A1B19902	W 06B 20 NOV 01 A1B11502	W 08D 21 NOV 01 A1B19901
1,1,1 TRICHLOROETHANE	UG/L	< 1	< 1	< 1	< 4	< 1
1,1,2 TRICHLOROETHANE	UG/L	< 1	< 1	< 1	< 4	< 1
1,1 DICHLOROETHENE	UG/L	< 1	< 1	< 1	< 4	< 1
1,2,4 TRICHLOROBENZENE	UG/L	< 1	< 1	< 1	< 4	< 1
1,2 DIBROMO 3 CHLOROPROPANE	UG/L	< 2	< 2	< 2	< 8	< 2
1,2 DIBROMOETHANE	UG/L	< 1	< 1	< 1	< 4	< 1
1,2 DICHLOROETHANE	UG/L	< 1	< 1	< 1	< 4	< 1
1,2 DICHLOROPROPANE	UG/L	< 1	< 1	< 1	< 4	< 1
BENZENE	UG/L	< 1	< 1	< 1	< 4	< 1
CARBON TETRACHLORIDE	UG/L	< 1	< 1	< 1	< 4	< 1
CHLOROBENZENE	UG/L	< 1	< 1	< 1	< 4	< 1
CHLOROETHANE	UG/L	< 1	< 1	< 1	< 4	< 1
CIS 1,2 DICHLOROETHENE	UG/L	< 1	0.3 J	< 1	2 J	< 1
ETHANE	UG/L	< 15	< 15	< 15		< 15
ETHENE	UG/L	< 13	< 13	< 13		< 13
ETHYLBENZENE	UG/L	< 1	< 1	< 1	< 4	< 1
METHANE	UG/L	9.7	24	22		120
METHYLENE CHLORIDE	UG/L	< 1	< 1	< 1	< 4	< 1
STYRENE	UG/L	< 1	< 1	< 1	< 4	< 1
TETRACHLOROETHENE	UG/L	< 1	< 1	< 1	< 4	< 1
TOLUENE	UG/L	< 1	< 1	< 1	< 4	< 1
TRANS-1,2-DICHLOROETHENE	UG/L	< 1	< 1	< 1	< 4	< 1
TRICHLOROETHENE	UG/L	< 1	< 1	< 1	< 4	< 1
VINYL CHLORIDE	UG/L	< 2	< 2	< 2	< 8	< 2
XYLENE, TOTAL	UG/L	< 2	< 2	< 2	< 8	< 2

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Appendix G
Electronic Data Deliverable

Appendix H
Surface Water Analytical Data - Fourth Quarter 2003

HOD LANDFILL
4TH QUARTER MONITORING RESULTS
NOVEMBER 2003

PARAMETER	UNITS	SW-01 19-NOV-03 A3B27202	SW-02 19-NOV-03 A3B27203	SW-02 DUP 19-NOV-03 A3B27201
COLOR, FIELD		CLEAR	YELLOW	
CONDUCTANCE, SPECIFIC	UMHOS/CM	789	844	
DEPTH TO WATER	FEET	0.71	1.28	
OXYGEN, DISSOLVED	MG/L	10.87	7.1	
EH, FIELD	MV	187	147	
ODOR, FIELD		NONE	NONE	
PH, FIELD	SU	8.44	7.97	
TEMPERATURE	DEG C	7.5	8.5	
TURBIDITY, FIELD		NONE	NONE	
CHLORIDE	MG/L	128	123	124
CYANIDE, TOTAL	MG/L	< 0.01	< 0.01	< 0.01
FLUORIDE	MG/L	< 0.5	< 0.5	< 0.5
HARDNESS AS CACO3	MG/L	251	283	278
NITROGEN, AMMONIA	MG/L	< 0.01	0.02	0.021
NITROGEN, AMMONIA, UN-IONIZED	MG/L	< 0.02	< 0.02	< 0.02
PHENOLICS, TOTAL RECOVERABLE	MG/L	< 0.005	< 0.005	< 0.005
SOLIDS, TOTAL DISSOLVED	MG/L	401	460	456
SULFATE	MG/L	19	27.4	35.8
ARSENIC, TOTAL	UG/L	< 10	< 10	< 10
BARIUM, TOTAL	UG/L	< 200	< 200	< 200
BORON, TOTAL	UG/L	< 100	< 100	< 100
CADMIUM, TOTAL	UG/L	< 5	< 5	< 5
CALCIUM, TOTAL	UG/L	46000	58000	57400
CHROMIUM, TRIVALENT	UG/L	< 0.03	< 0.03	< 0.03
CHROMIUM, TOTAL	UG/L	< 10	< 10	< 10
CHROMIUM, TOTAL HEXAVALENT	UG/L	< 10	< 10	< 10
COPPER, TOTAL	UG/L	< 10	< 10	< 10
IRON, DISSOLVED	UG/L	< 100	304	308
LEAD, TOTAL	UG/L	< 3	< 3	< 3
MAGNESIUM, TOTAL	UG/L	33100	33500	32800
MANGANESE, TOTAL	UG/L	20.5	72.1	71.2
MERCURY, TOTAL	UG/L	< 0.2	< 0.2	< 0.2
NICKEL, TOTAL	UG/L	< 10	< 10	< 10

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HOD LANDFILL

4TH QUARTER MONITORING RESULTS

NOVEMBER 2003

PARAMETER	UNITS	SW-01 19-NOV-03 A3B27202	SW-02 19-NOV-03 A3B27203	SW-02 DUP 19-NOV-03 A3B27201
SELENIUM, TOTAL	UG/L	< 5	< 5	< 5
SILVER, TOTAL	UG/L	< 10	< 10	< 10
ZINC, TOTAL	UG/L	< 20	< 20	< 20
1,2-DICHLOROETHENE, TOTAL	UG/L	< 1	1.4	1.4
CARBON DISULFIDE	UG/L	< 1	< 1	< 1
TRICHLOROETHENE	UG/L	< 1	< 1	< 1
VINYL CHLORIDE	UG/L	< 2	< 2	< 2

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